

MODEL AIRPLANE NEWS

JANUARY 1944 • 20 CENTS

An AIR AGE Publication



GRUMMAN HELLCAT

Jo Kotula

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● Presenting the Boeing B-17E U. S. Army Bomber! First in a series of authentic solid scale model kits by Testor, this accurate miniature of the world-famous "Flying Fortress" is based on official U. S. Navy Bureau of Aeronautics scale design prepared especially for the Model Aircraft Project. Kit contains fully shaped wood parts, sandpaper, cement, filler, printed trim and in-

signia; is complete with detailed step-by-step photographically illustrated instructions and assembly drawings explaining exact procedure to be followed. No carving! No guess work! See your dealer for one of these genuinely superior kits today, *but please be patient if he does not have stock on hand.* Advance orders have been extremely heavy, and some delay will be unavoidable before we can supply all the hobby shop, department, chain, hardware, and sporting goods stores throughout the country that want to handle this new Testor line.

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"and now... Good Luck and Good Hunting"

This is the day.

This is the day I've been waiting for. This is the day I've looked forward to since I was seventeen . . . this is the day I win my wings.

Mom and Dad are waiting there. Dad's standing tense and straight and tall, and his face looks proud and grim, as though the General were talking to him.

" . . . they tell me you're hot pilots and navigators and bombardiers. And it is well you are . . ."

As we marched in, Mom waved and I caught the lift of her hand, and the white flutter of her handkerchief out of the corner of my eye. And I know in a moment or two she's going to cry—just a little—like she did the night we talked it all out, she and Dad and I, when I told them I wanted to fly.

" . . . to your families, I say—ours is the safest military flying of any of the world's air forces."

And now here on the parade grounds, with

the shadows falling and the bright flag whipping in the sky, I remember just how back home they listened and how finally Dad said, "Son, your Mother and I won't stand in your way. If this is what you want to do—do it with all your heart and soul and God be with you—we think you're right. And as for me—I wish I were your age—so I could fly and fight."

"And I say to you cadets, get the enemy in your sights and let him have it . . ."

Now, in just a minute, we'll right face and walk up to the platform under the flag. The General will hand me the parchment, and then he'll pin silver wings on my blouse and return my proud salute.

"The world has never before seen a team like the Army Air Forces . . ."

Thinking of all the days and nights packed with hard work . . . our college training . . . the numberless flights with patient instructors . . . the painstaking way we were taught to fly safely on instruments, when even birds

were grounded . . . how, flying wing tip to wing tip, we were brought together closer than brothers . . . I understand what our General means. The Army Air Forces are more than planes, more than men, more than machines—a great team with one aim, one object, one goal.

" . . . to sweep the skies clear, so free men may walk with their heads up and without fear . . ."

And as the last man receives his wings and the gun booms out and we stand retreat and the flag comes slowly down, I'll thank God my father and mother gave me the chance to win my wings . . . gave me the opportunity to have a soldier's pride in belonging to the greatest group who ever fought or flew . . . gave me a future and a career!

"And now, gentlemen, we have work to do—and I leave you . . . good luck—and good hunting."

U. S. ARMY RECRUITING SERVICE

If You are 17...



There's an important place for you in the Army Air Forces. You will receive fourteen months of training. You will live and work with the finest type of young men. You'll fly in American planes, the best and safest that money and engineering skill can build. You will be well-paid. And when the war is over, you'll be qualified for leadership in the world's greatest new industry—Aviation!

Go to your nearest Aviation Cadet Examining Board today . . . take your preliminary examinations to see if you can qualify for the Air Corps Enlisted Reserve. If you qualify, you will receive your Enlisted Reserve insignia but will not be called for training until you are 18 or over.

If you are 18 but under 27 . . . go to your nearest Aviation Cadet Examining Board right now . . . see if you can qualify as an Aviation Cadet. If

you are in the Army, you may apply through your commanding officer. When called, you'll be given 5 months' training (after a brief conditioning period) in one of America's finest colleges . . . you'll get dual-control flying instruction . . . then go on to eight months of full flight training. When you graduate as a Bombardier, Navigator or Pilot—you will receive an extra \$250 uniform allowance and your pay will be \$246 to \$327 per month.

If you are under 18 (whether or not you have joined the Air Corps Enlisted Reserve) . . . you should see your local Civil Air Patrol officers about taking C.A.P. Cadet Training—also see your High School principal or adviser about the recommended courses of the Air Service Division of the H. S. Victory Corps. Both will afford you valuable pre-aviation training.

(Essential workers in War Industry or Agriculture—do not apply)

KEEP EM FLYING!

"Nothing'll Stop the Army Air Corps"

For information regarding Naval Aviation Cadet Training, apply at any Naval Aviation Cadet Selection Board or any Naval Recruiting Station; or, if you are in the Navy, Marine Corps or Coast Guard, apply through your commanding officer . . . This advertisement has the approval of the joint Army Navy Personnel Board.

MODEL AIRPLANE NEWS

JANUARY, 1944

VOL XXX, No. 1

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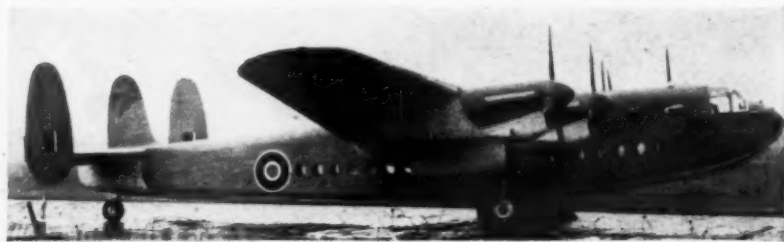
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NEW SUPER-HEAVY bombers now in production will be on the firing line by Spring . . . added medium-bomber firepower will stagger the enemy (with interchangeable noses for diversified tactical operations) . . . A new single engine fighter, designed for greatly increased performance is in production. . . The Bell Airacobra, improved by a two-stage, supercharged Allison, joins the Spitfire, Mustang, Lightning and Thunderbolt at 40,000 ft. . . Oct. 15th and 16th were lucky days for General MacArthur: his skyfighters got him 104 for 2. . . The studied, persistent attention paid by the Allied Air Forces to Nazi fighter plants cut production below replacements. . . Bomber crews lost on a raid get no credit for fighters shot down . . . Eighth Air Force officials emphasize that reports of enemy losses are calculated with mathe-

craft. Two 2,000-h.p. engines haul its 27,900 lbs. plus cargo at 250 per. The late Eddie Allen tested the prototype, CW-20, in 1940 though basic design was established back in 1936. . . The Russian Air Force has encountered a fourth model of the Messerschmitt, Me-109G, higher powered and better streamlined than its predecessors. . . A new, indigestible diet being served to Goering is the "Blue Goose," a .50 incendiary bullet dished up to ignite self-sealing fuel tanks. The chef, Remington Arms, claims this blue-tipped goose can pass through any air-armor yet devised. . . Joseph T. Hartson, new president of the Glenn L. Martin-Nebraska Company, assumes the enormous responsibility of producing a new type warplane for the Army.

LORD SHERWOOD, Under Secretary of State for Air, declares 10,000 swas-



New Avro York transport is 50-passenger 102 ft. giant powered by 4 Rolls-Royce Merlin



matical precision. Say also that one daylight raid by Fortresses drops as much explosive as could be fired by a battery of 12,000 ten-inch guns. . . Britain-based airmen are meeting 60% of the German fighter and 80% of German anti-aircraft defenses, keeping six million Fritzies on constant alert. . . Final aerial box score from Pearl Harbor to September 1, 1943—Yanks 4, Axis 1—in detail, 7,312 to 1,867.

FROM THE ENEMY comes information about the American "Aerial Dragon"—Fortresses, without bombs, crewed by 17 skyfighters, armed with several cannon and thirty machine guns. Purpose: to act as fighter escort for its bomb carrying sisters, as predicted by this mag over a year ago. . . Curtiss Commando C-46, largest twin engine freighter in the world, is in unparalleled production by Curtiss-Wright and Higgins Air-

tikaed planes were shot down over Britain, plus 5,000 over Il Duce's own sea. . . "Aeroplane" makes the total up to October 10th 17,693 (excluding Russia) . . . Overall, but unofficial, air combat is scored at better than 5 to 1 for the Navy. . . Up to September 1st, U. S. flyers took off on 223,758 sorties. . . Armstrong-Siddeley has blueprinted a 132-ton transport; heaviest today weighs 70 tons, the Martin Mars. The latter was turned over to the Navy for tests on Nov. 2nd. The Martin tests showed that it could, without refueling, fly from Baltimore to Berlin to Baltimore and then on to London—with two of four engines on the same side cut out it could climb—take a 210-ton load on each wing in a dive from 13,000 ft.—carry sixteen passengers and 15 tons of cargo, plus crew. . . One operation against Bremen included 855 planes, 5,000 men and burned up 1,000- (Continued on page 48)

PLANS AND PHOTOS FOR 21 GAS MODELS!



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"The Yankee"—Class "A" by Sal Taibi.
The G.E. "Cabinette"—Class "A" by Frank Ehling.
Record Breaking Gas Model—Class "C" by Chester

Lanzo.
Army Scout (Curtiss-52)—Class "A-B" by Sidney Struhl.
Universal One Wheeler—Class "C" by Leon Shulman.

How to Put "Revs" in Your Gas Prop. by Frank Tlush.

A True Pitch "Gas Propeller" by H. A. Thomas. Bring Them Down Safely by Carl Goldberg.

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As previously announced, the manufacture of the SUPER-CYCLONE was suspended in April, 1942, for the duration of the war. We have no more engines for sale. The resources of this Company and affiliated Companies are devoted to the winning of our peace. When this is achieved, our engineers will again develop the same high-quality engines we have manufactured in years past.

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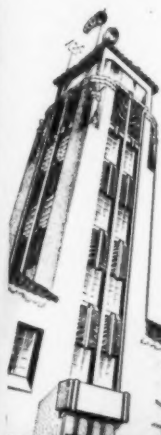


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N-1

TORPEDO!





The torpedo bomber is the battleship's deadliest enemy. Invented in 1912 it is today's most powerful aerial weapon against sea power

by **KEITH AYLING**

THE first torpedo plane to make its appearance was a Short float biplane that flew at the famous Weymouth naval review held by King George V of England early in May, 1912. This plane, piloted by Lieut. Commander Longmore, launched the first Whitehead torpedo from an airplane late in 1913. (Editor's Note: There is some controversy over who actually invented the first torpedo-carrying airplane combination. Personally, we feel that Rear Admiral Bradley A. Fiske, U.S.N. deserves this honor. He first conceived such tactics in 1911 and was granted Patent No. 1,032,394 on July 16th, 1912, making claims for a torpedo-carrying apparatus including method of directing and delivering an airplane torpedo.)

The critics were openly skeptical of the new "contrivance" even though it had been successfully accomplished. Early in 1915 the British R.N.A.S. reported a torpedo success when Flight Lieut. Ed-

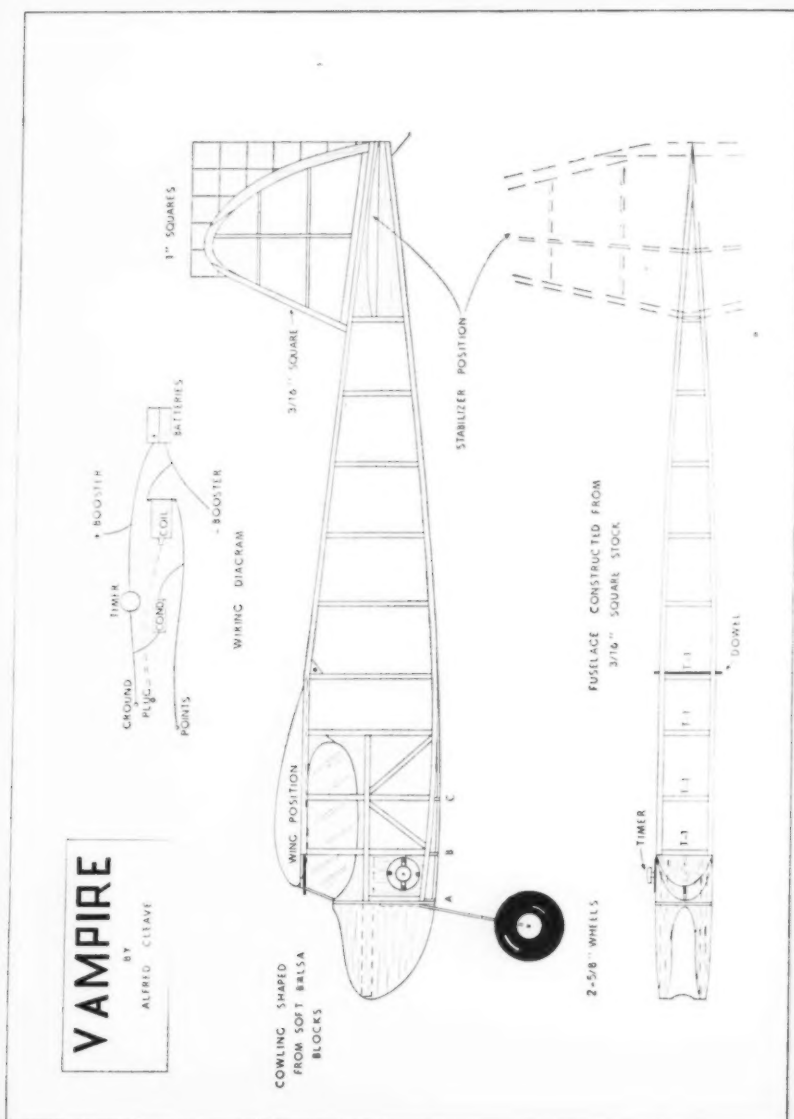
munds soared over Gallipoli Peninsula and sank a Turkish transport off the island of Maidos. In 1916 an R.A.F. flight lieutenant, in a Bristol carrying a 14" torpedo weighing 731 lb., made four flights over the Sea of Marmosa and on the last flight sank four Turkish vessels.

In practice, Captain Alessandro Guidoni of the Italian Air Force scored 9 hits out of 10 attempts at 3,000 yards in 1915 using special light torpedoes, since his plane was not capable of lifting the full size naval torpedoes.

Later in that war the British produced the Blackburn Kangaroo, a twin-engine land-based torpedo bomber, father of the modern torpedo carrier. This first land-based torpedo plane was the ancestor of the latest torpedo bomber, that has many advantages over the same carrier-based craft. Chief of these are superior speed, range and load carrying capacity, in addition to greater freedom allowed the de-

(Continued on page 30)

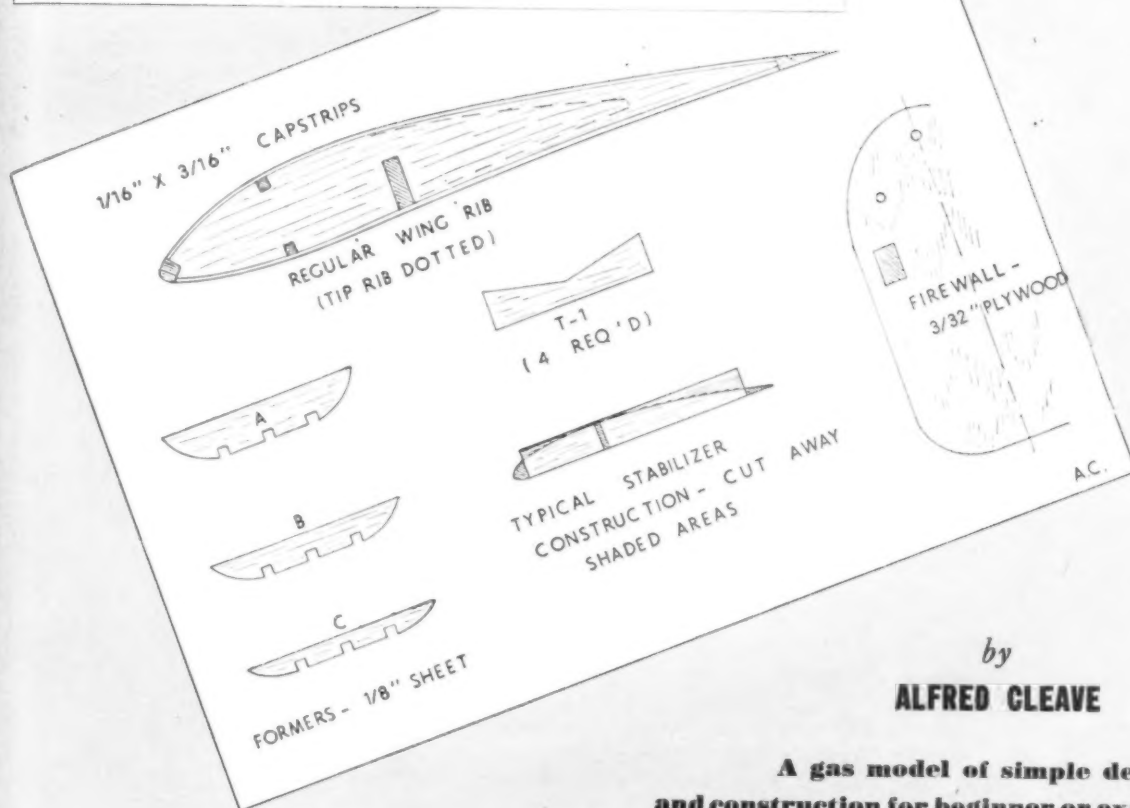
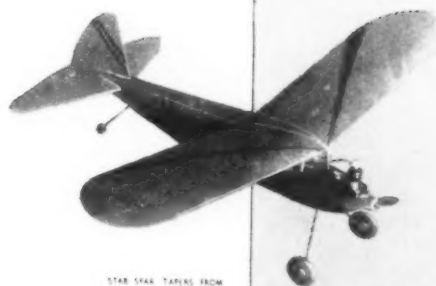
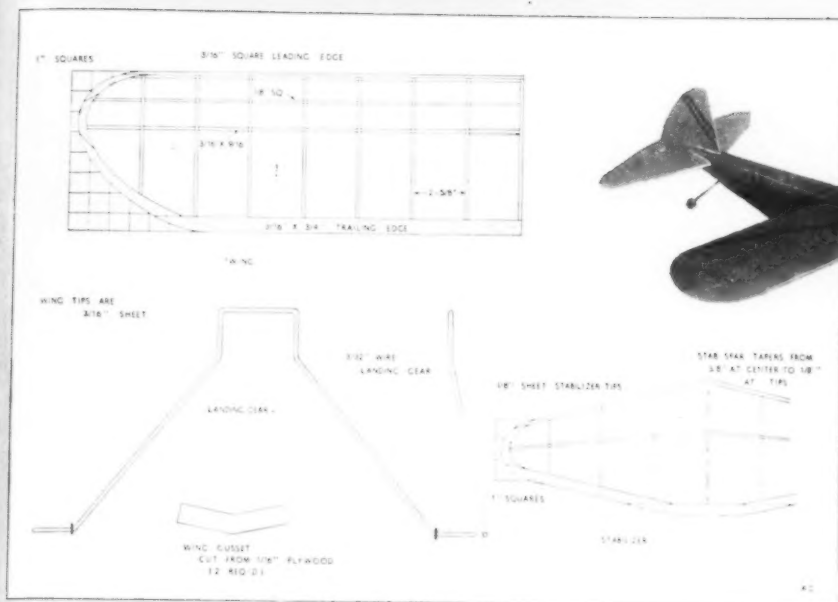
The VAMPIRE



THE Vampire is of simple construction and is realistic in flight. Original construction was balsa, but due to simplicity it can be built from pine or basswood without radical changes in framework design. The model flies well, having a steep spiraling climb and gliding in gentle circles. An Ohlsson "23" was used for power, but any Class B motor may be used with equal success, the only change necessitated is the spacing of motor mounts.

FUSELAGE CONSTRUCTION: Before beginning actual fuselage construction scale up the side view. It is not necessary to enlarge the top view since measurements for the crosspieces may be taken directly from the plans and merely made longer. Cover the plans with a sheet of waxed paper to prevent cement from adhering. Build the fuselage sides from 3/16" square stock. By building both sides at once, one on top of the other, they can be made more accurately since they will be identical. Join the two sides with the pieces cut from the top view, checking constantly to be sure the fuselage is straight. Cut the formers from 1/8" sheet and when these are cemented in place add the 1/8" square stringers on the bottom. Next cut the firewall from 1/8" sheet plywood and cement it to the position shown on the front of the fuselage.

Cement the motor mounts in place and bolt the 3/32" wire landing gear to the firewall. Cowling is shaped from soft balsa blocks; if the builder desires, thin plywood may be used for the cowling upper part and around the bottom of the windshield. The rest of the window outlines are 1/8" sheet. Cut the former at the front of the wing position as shown on the top view from 3/16" sheet; cut it down in a "V" shape to form a base for the wing. Fill in the section around the timer with 3/16" sheet and cement the



by

ALFRED CLEAVE

**A gas model of simple design
and construction for beginner or expert**

dowels and gussets in place which hold the wing rubber bands.

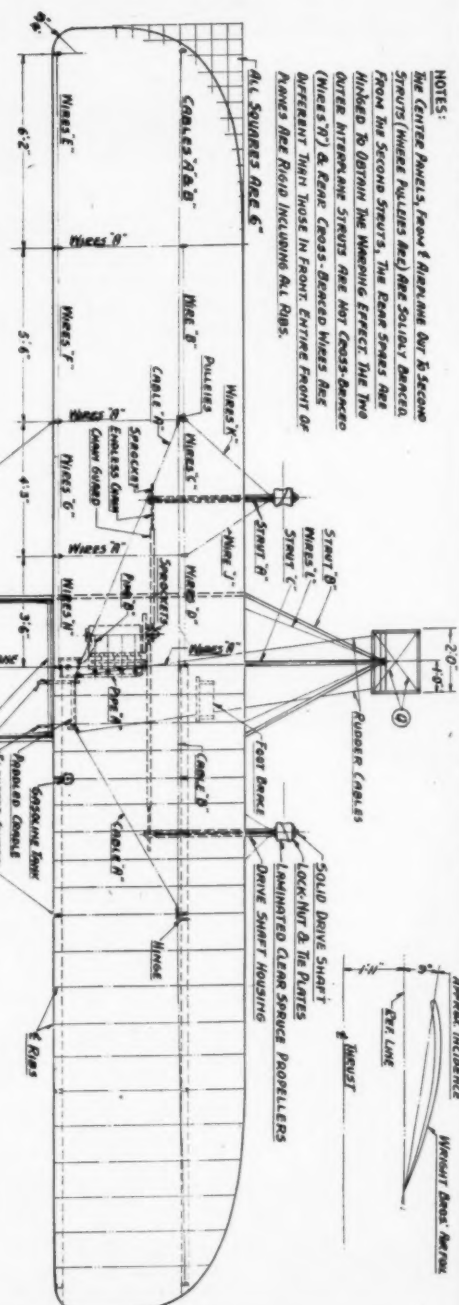
WING AND TAIL SURFACES: Begin by scaling up the wing, stabler and rudder. Place a sheet of waxed paper over these plans also. Cut the 16 regular ribs and the 2 tip ribs from 1/16" sheet. The trailing edge is 3/16" x 3/4"; the lead-

ing edge is 1/4" square. The wing tips are made from 3/16" sheet. Pin the trailing edge in place on the plans and cement the rear of the ribs to it, using pins to hold them in position, and cement the leading edge to the nose of the ribs. Add the tips, and when the structure has dried thoroughly lift it from the plans and ce-

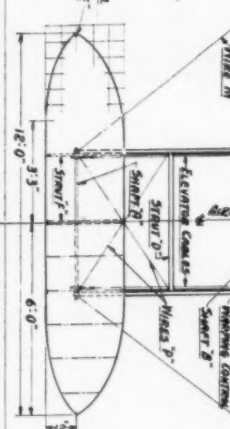
ment the spars of 1/8" square and 3/16" x 9/16" in place. Cement the capstrips of 3/16" x 1/16" softstock in place over the ribs, taking care to make a neat joint where they join the leading and trailing edges. Sand the entire wing thoroughly and cement the wing halves together with
(Continued on page 36)

NOTES:

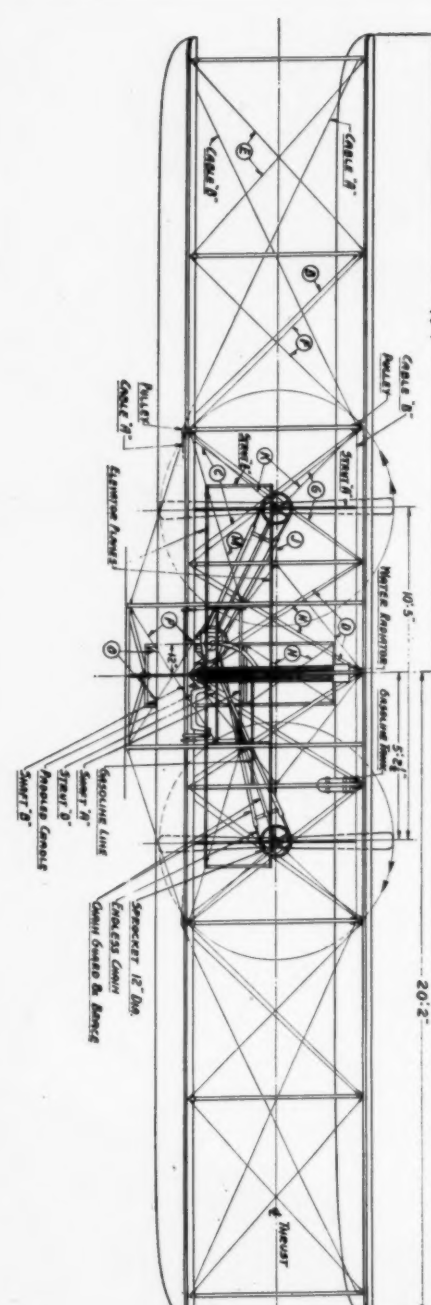
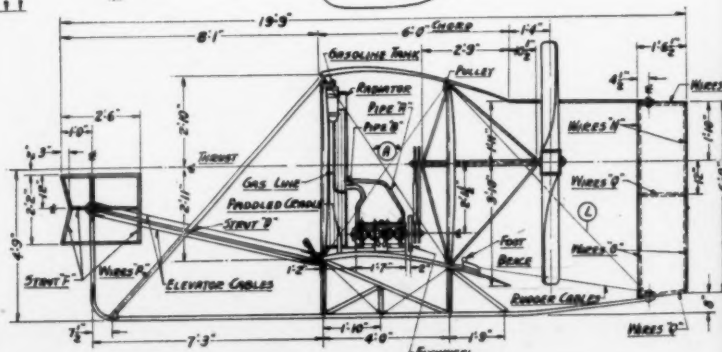
THE CENTER PULLEY, FROM 8' FROM THE OUT TO SECOND STRUTS (WHERE PULLEYS ARE) ARE SOLIDLY BARNED FROM THE SECOND STRUTS, THE BEAM SPACES ARE HINGED TO OBTAIN THE WINGING EFFECT. THE TWO OUTER INTERMEDIATE STRUTS ARE NOT CROSS-BARNED (WIRES 'H' & 'I' ARE CROSS-BARNED WIRES ARE DIFFERENT THAN THOSE IN FRONT. ENTIRE FRONT OF PULLEY ARE RIGID INCLUDING ALL RIGS.



NOTES:
ALL RIGS, SPACES, STRUTS & FRAMES ARE OF SPURCE & FISH CONSTRUCTIONS.
ALL RAIL SHOCKERS, BENT TOP & DISCONNECTS ARE COVERED BY FINE DUCK CANVAS.
ALL EXPOSED PARTS OF ALUMINUM ARE FINISHED ALUMINUM.
ALL WIRE & STEEL FITTINGS ARE STEEL.

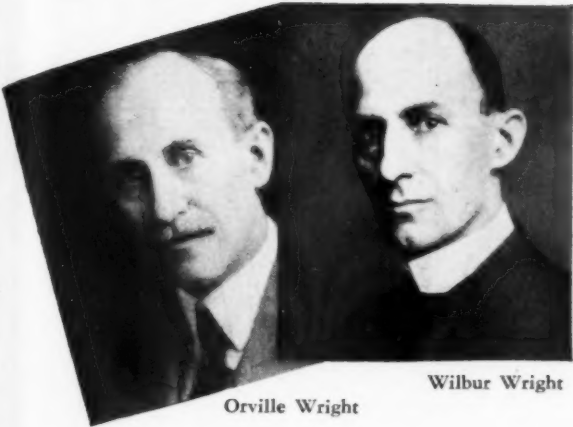


NOTES:
WHEREAS THE WINGS OUTER RAKE COENERS THEY CABLES 'A' & 'B', CONTROLS THE LATERAL BALANCE. TILTING THE ELEVATOR PLANS THEY ELEVATOR CABLES CONTROLS THE CLIMB OR DESCEND ORIENTATIONS TURNING THE RUDDER IS FROM WINGING CONTROL; RUDDER CAN ALSO BE TURNED WITHOUT TURNING WINGS



NOTES:
ENGINE IS A CYLINDER WATER COOLED & MADE BY WRIGHT BROTHERS. IT IS EXACTLY 400 R.P.M. IT IS MOUNTED ON THE SIDE & IT DRIVES TWO PROPELLERS IN OPPOSITE DIRECTIONS.

SCALE: 1" = 1'-0"
DATE: NOV. 1943
DRAWN BY: W. ALWYLAN
GENERAL ARRANGEMENT
WRIGHT BROTHERS ORIGINAL
"FLIER"



Orville Wright

Wilbur Wright

FORTIETH ANNIVERSARY

THIS Air War that today holds the entire earth in a grip of terror would have been dismissed forty years ago as the hallucination of an insane mind.

On December 17th, 1903, Wilbur and Orville Wright successfully flew and controlled an airplane for the first time in all history. However, such Macchiavelian instruments of death and destruction as we find in the skies today were beyond the ken of those immortal brothers as they stood on that wind-swept stretch of sand dunes at Kitty Hawk, North Carolina, and warmed the engine of their flying machine. But today's monstrous weapon of aerial annihilation is a blood descendant of that same frail, kite-like structure that was hauled, trembling and weaving, into the skies to conquer man's earth-bound servitude and release him into the upper air. The Wrights' only thought was the unspoken promise of swift, direct passage to foreign places in a peaceful civilized world. But man quickly armed this new toy and set about to kill his brothers in a new and more deadly manner. Perhaps it is significant the War Department was the first purchaser of a flying machine, not only in these United States, but in foreign countries as well. Not until the airplane had



First Army contract for airplane

proved itself of use to the military was it accepted as a new accomplishment of man's creative mind.

But can development and perfection of destructive instruments be called progress? Is not the modern passenger airliner the true example of aeronautical progress?

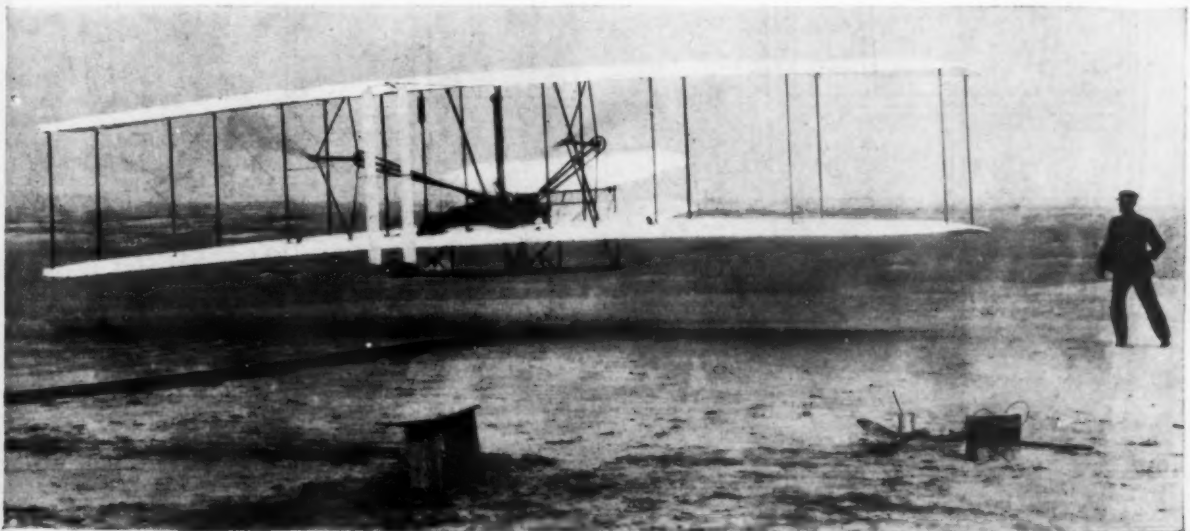
When we survey forty years of aviation development can we not point to the modern Douglas airliner, the huge Mar-

tin Clipper and the giant Boeing strato-liner as the one example of aerial progress? Our nation's great network of airlines, its record of safety and service, of dependability and punctuality is most assuredly the true index to these forty years of development.

The Wright Brothers' success was met with a wave of disbelief and scepticism and they were roughly handled by the press of the time. The first flight, with Orville at the controls, was barely a skip, but three other flights were made that day, the last covering 850 feet in 59 seconds. The machine was wrecked upon landing and the experiments discontinued.

Returning to Dayton, Ohio, they hurriedly constructed a second machine and resumed operations in the spring of 1904. On September 20th, they completed the first circular flight, landing at the take-off point. During 1904 they made more than a hundred flights and in 1905 they reached a record of 24 miles in 38 minutes. Throughout 1906 they continued to fly and in 1907 offered to sell all their rights to the United States government, but Congress refused an appropriation. However, the War Department took in-

(Continued on page 45)



Most prized photograph in aviation history shows first takeoff by Orville Wright in first successful flying machine Dec. 17, 1903



NOSE SECTION
CARVED FROM
SOLID Balsa

COCKPITS COVERED WITH
THIN CELLULOID



WING SLIPS IN THIS SLOT

040 WIRE LAUNCHING HOOKS

As
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AS A weapon of war the glider has come of age. First successfully used by Germans in the invasion of Crete, these motorless carriers of men and munitions more recently figured prominently in the Allied conquest of Sicily.

Towed to a point near their destination by large twin-engine transports which likewise carry supplies and even paratroopers, the glider cuts free to make a stealthy approach. Virtues of the glider are numerous: it lands lightly in small space and when necessary even "crash lands" without serious damage to crew or cargo. It is inexpensively and quickly built, thus is expendable. Because of a "whispering" approach, it provides a measure of surprise.

Aside from the glider's combat importance, it offers great new possibilities in air transport. In England recently a glider descended through the cloud ceiling to make a smooth, graceful landing on an airfield. Utilizing the "sky-train" technique it had just flown across the Atlantic. The glider was towed by a Douglas C-47 transport (similar to the commercial DC-3) and the 3,500-mile journey was completed in 28 hours. (See November, 1943, issue.)

Recognizing its importance in aggressive warfare, the U.S. Navy has developed a unique and efficient glider; it is amphibious, landing either on land or water. As a troop transport it is capable of carrying twelve fully equipped men. Construction is entirely of plastic bonded plywood. These ships are built by Allied Aviation and Bristol Aero and, of course, performance data and specifications are restricted.

Our model is a faithful reproduction of

the prototype. Of simple construction it is nevertheless a capable flyer. When hand- or tow-line launched the little ship floats down in an easy curve to a smooth landing.

CONSTRUCTION: The manner of construction is entirely conventional; the model can be built quickly and easily. While balsa was largely employed on the original, white pine, spruce or bass can be substituted without impairing flying qualities. When it is necessary to substitute these slightly heavier woods the cross-section size can be reduced since they are also stronger. Regular model airplane cement is used in either case; however, regardless of the wood being

used, make the structure as accurate as possible and cement each joint firmly.

The fuselage consists of a simple rectangular frame about which the shape giving formers and stringers are assembled. Join the plans together and build the two sides of the underframe (shaded) directly over it—make one atop the other so they will be identical. Erect the sides over the top view and join them with cross pieces; check the structure frequently for correct alignment. Formers are shown full size and they are cut from the sheet; a number of them are identical so be sure to make any extra required. A few have no notches and when

(Continued on page 62)



SOME FUSELAGE STRINGERS
OMITTED FOR CLARITY

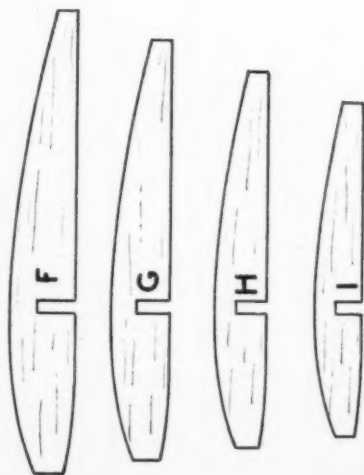
1/16" SHEET

UNDERFRAME (SHADED) 3/32" SQ.
FAIRING STRINGERS 1/16" SQ.

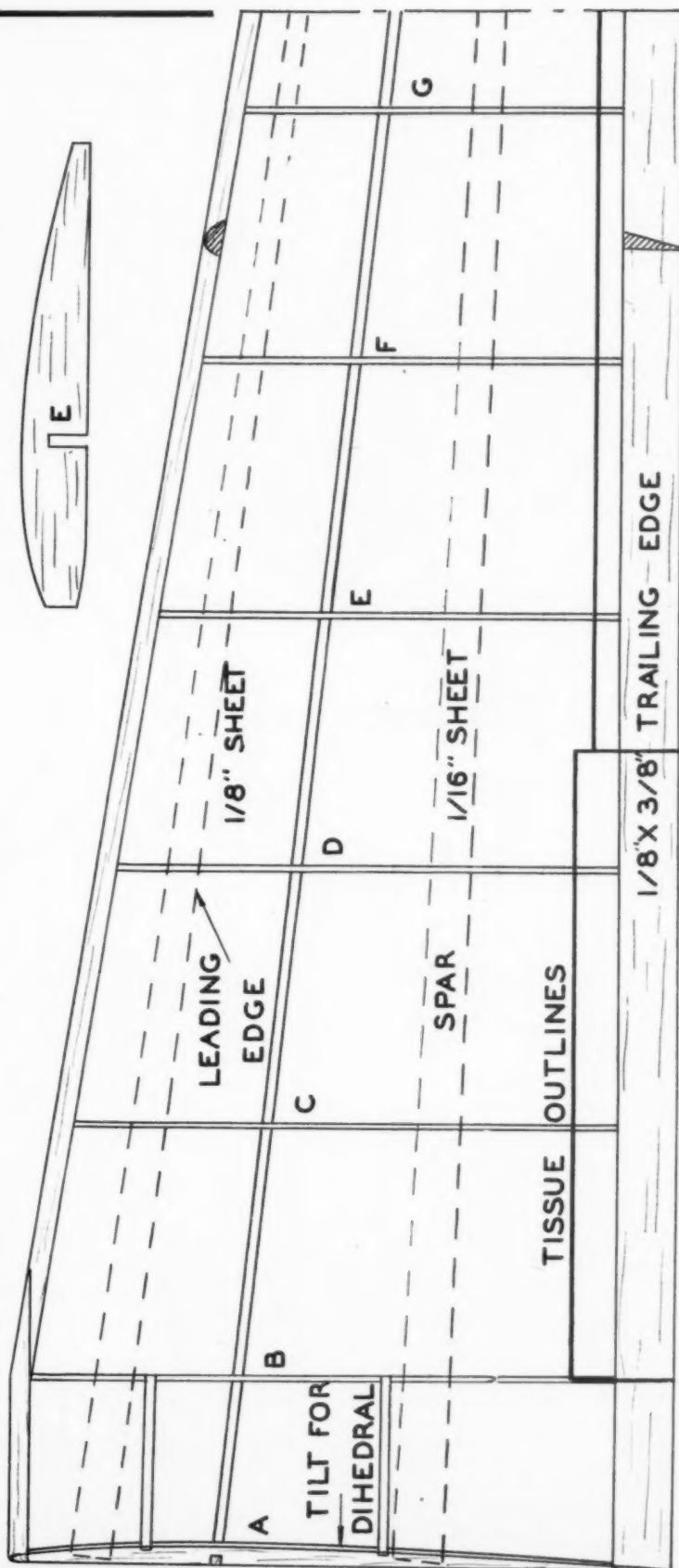
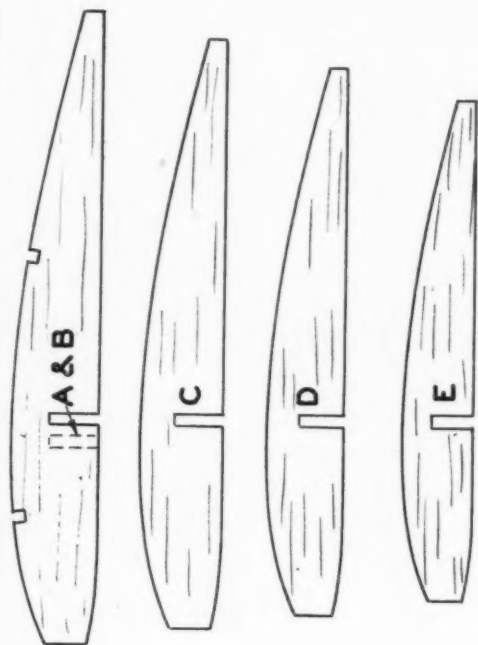
STABILIZER FITS
IN SLOT AS
SHOWN

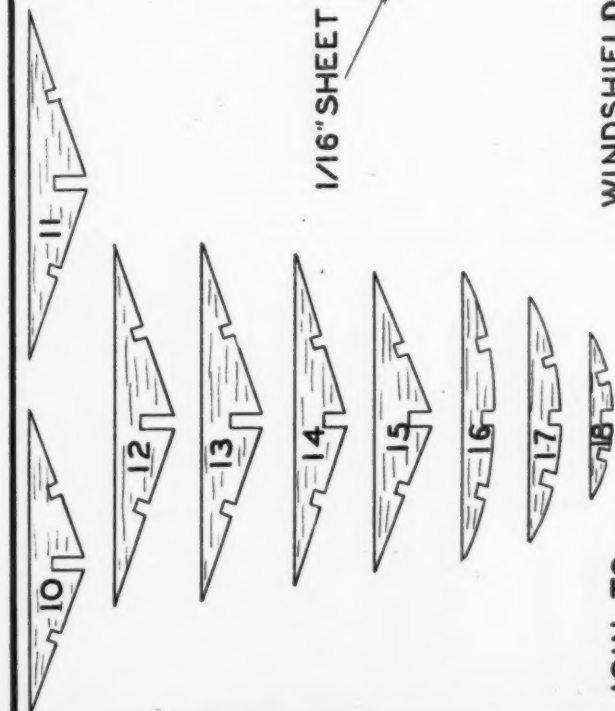
JOIN FUSELAGE
DRAWINGS

NAVY TROOP GLIDER
BY
EARL F. STAHL



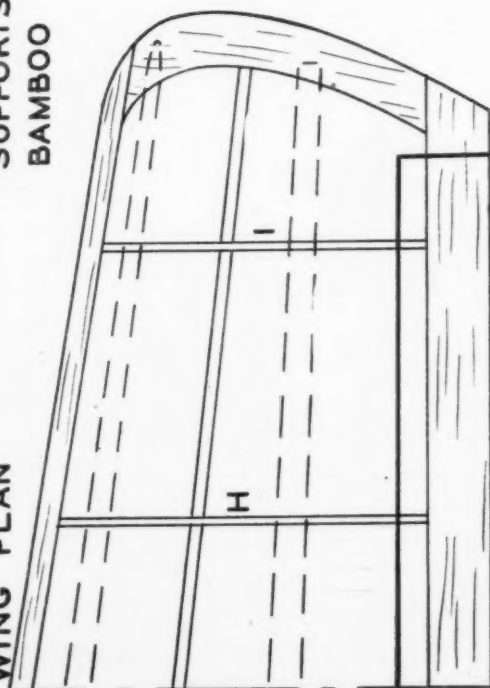
WING RIBS
CUT FROM 1/32"
SHEET 2 EACH



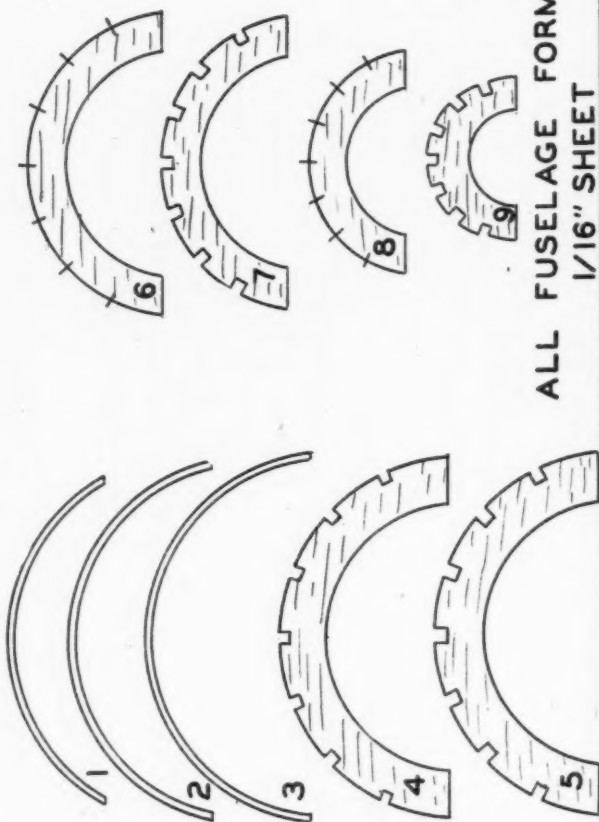
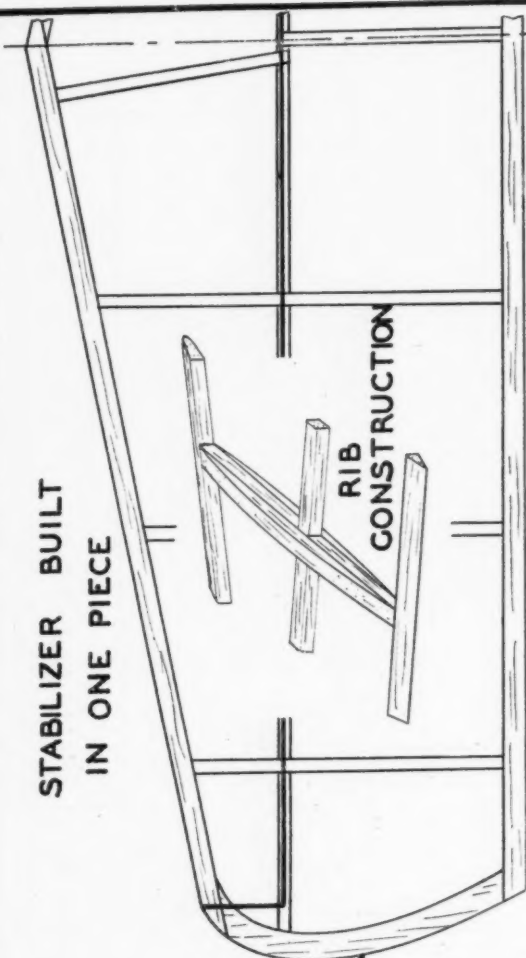


JOIN TO
WING PLAN

WINDSHIELD
SUPPORTS
BAMBOO



STABILIZER BUILT
IN ONE PIECE



HELLCAT!

GRUMMAN F6F-3 Latest U. S. Navy Fighter

[illegible]

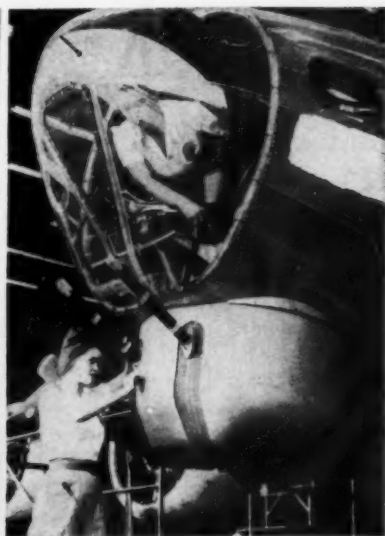
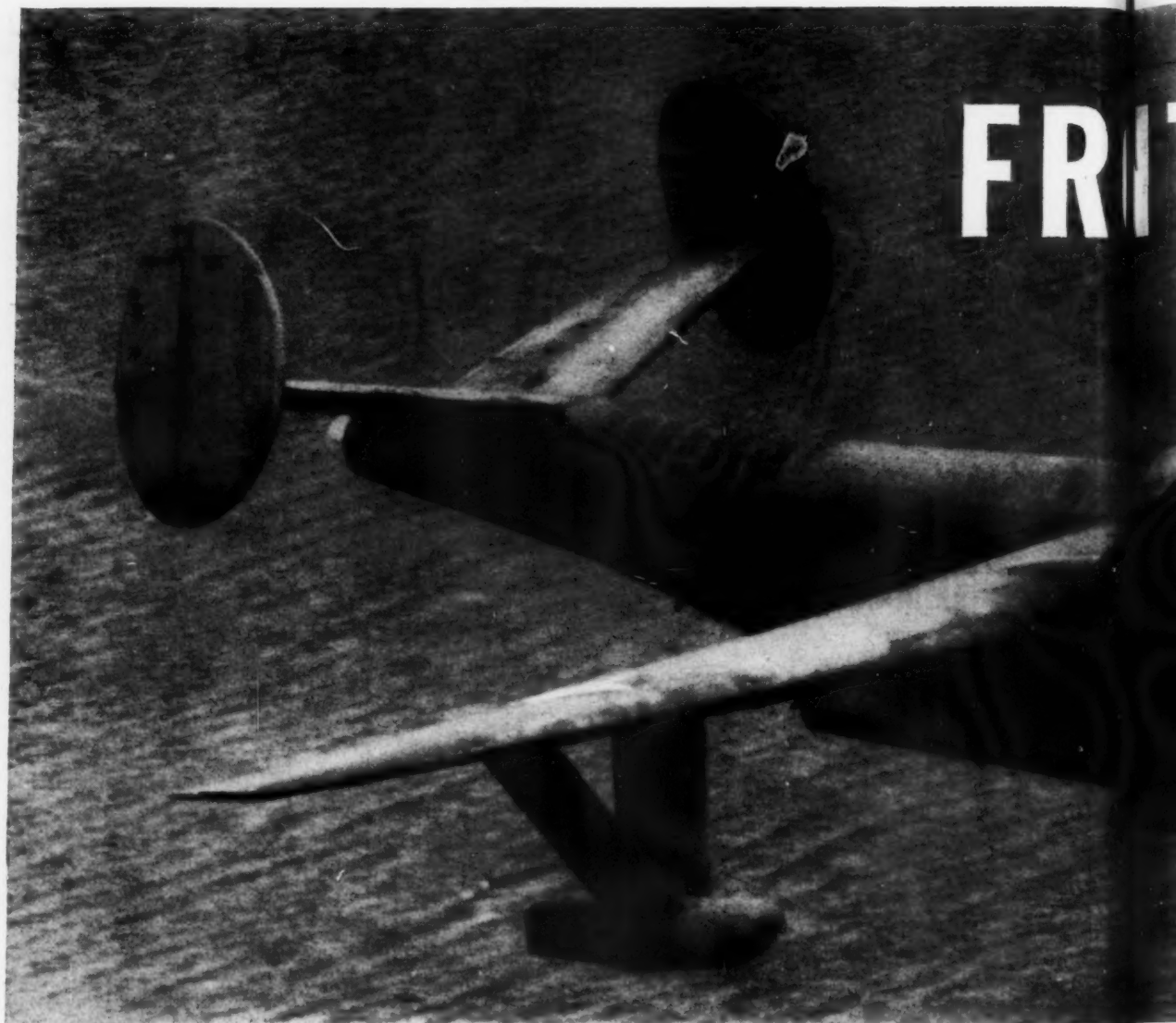
IT WAS 1929 and things were tough! But besides a slight economic upheaval being recorded on Wall Street and a few million of us being reduced to poverty, a very major event occurred in American aviation which was, one day, to have repercussions of a global nature: The Loening Aeronautical Engineering Corporation found itself in such embarrassing financial circumstances that it was forced to join solvent Keystone Aircraft Corporation. The idea did not appeal to Loening's General Manager and Chief Engineer, a red-headed, blue-eyed young man of somewhat independent demeanor known as Leroy R. Grumman, and he forthwith severed relations with the new firm.

Grumman knew one thing well: the design and manufacture of airplane floats, and it was with this in mind that he rented a grease-stained garage in Baldwin, Long Island (New York) and hung out a huge sign bearing the legend: *Grumman Aircraft Engineering Corporation*. With a total personnel of 21, six in the office and fifteen in the shop, he set out to design and manufacture airplane floats, in the very depths of the depression!

Grumman's patents on folding gears for floats, his long years of designing and manufacturing experience, and his amiable salesmanship brought him contracts from the Navy Department for floats and amphibian parts and by 1931 the

(Continued on page 58)

FRONT



Latest Fortress, the Boeing B-17G, mounts new chin turret remotely controlled bringing total firepower to 13 machine-guns of .50 calibre

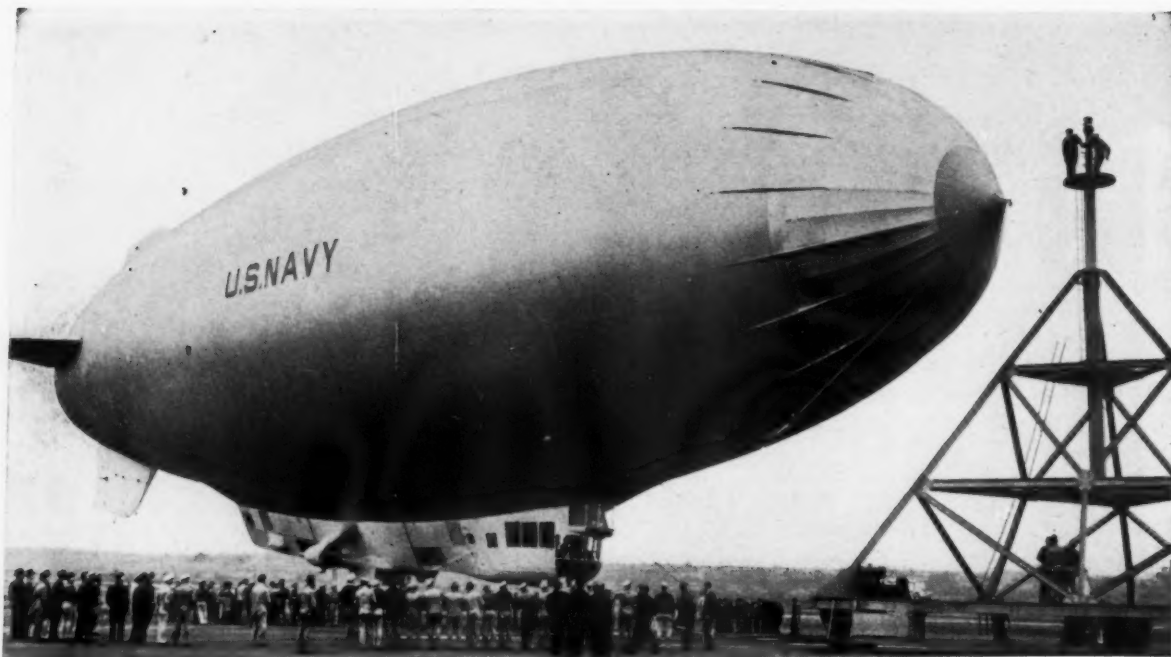
RITTIERS



The giant 70 ton Martin *Mars* (XPB2M-3) flying boat recently remained aloft 32 hours. Navy will use it as cargo carrier



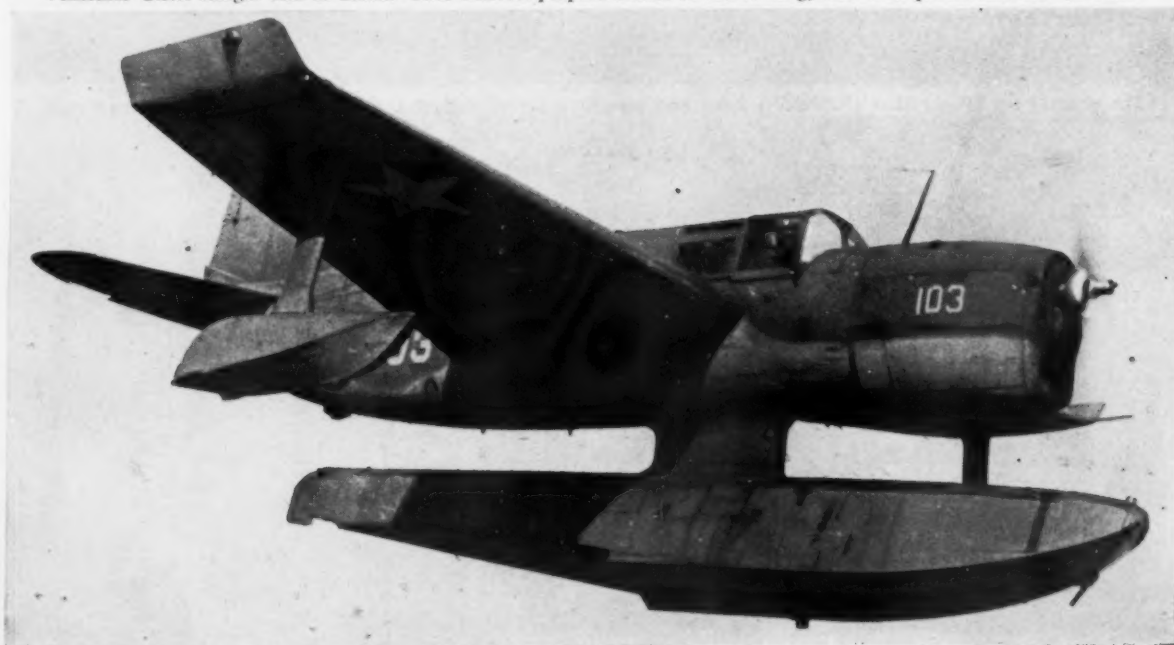
Vought *Vindicator* (SB2U-3) dive bomber sees service as utility training plane. Note bomb displacement gear under fuselage



The Navy's newest and largest non-rigid airship, the M-1, has 620,000 cubic feet capacity and carries guns and bombs



Venerable U.S.S. Ranger still in action. First built-for-purpose carrier is 769 ft. long, carries 85 planes and does 30 knots



200 mph Curtiss Seagull (SO3C-2) sees heavy duty with the cruiser scouting forces directing gunfire. Air cooled Ranger engine

DESIGN FORUM

Analysis and discussion of ideas submitted by readers

THE last Forum consisted mainly in discussing the importance of type selection as the first step in airplane design. Since various types fall into certain weight and size categories, this initial selection will determine, roughly, the general appearance.

For instance, a single-seat, single-engine fighter has a wingspan of 34 to 36 feet and length of 26 to 28 feet. A twin-engine, single-seat interceptor is slightly larger, with a span of 45 to 50 feet and length of 30 to 35 feet. The light bomber is larger still, with a span of 55 to 60 feet and length of 45 to 50 feet. The medium bomber, actually the same class as the light bomber, has a span of 65 to 90 feet and length of 50 to 60 feet. The heavy bomber has a span of 100 to 125 feet and length of 60 to 70 feet. The super bomber, the largest type, has a wingspan of more than 200 feet and is more than 100 feet long.

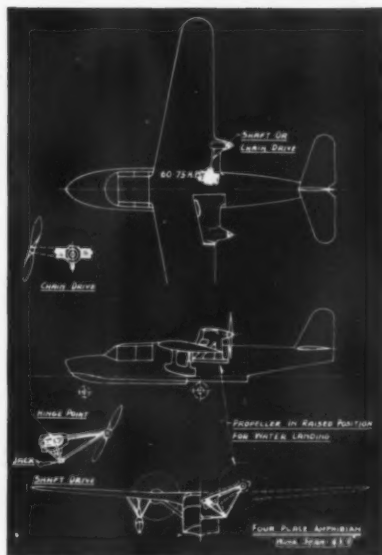
Thus, within limits, the type selection determines the wingspan. This will also hold true for the machine's gross weight. The fighter will weigh approximately 6,000

lb., the interceptor, 10,000; the light bomber, 20,000; the medium bomber, 30,000; the heavy bomber, 50,000, and the super bomber from 100 to 200,000 lb.

It is now possible to determine some approximate relationships. For instance, the weight of the airplane structure will constitute approximately *one-third* of whatever gross weight is chosen. The powerplant consumes about *one-fourth* the gross weight. Fixed equipment amounts to about *one-tenth* the gross weight and the remainder of the weight, about *one-fourth* to *one-third*, constitutes useful load of the airplane.

Next step is preliminary determination of the wing area as a function of the gross weight. Wing loading does not vary greatly with various types of airplanes, although it normally is slightly higher for lighter weight ships. For a fighter it is from 40 to 50 lb.-sq. ft., for the light bomber from 35 to 45 lb.-sq. ft., and in the heavy bomber category it is from 30 to 40 lb.-sq. ft.

With these facts, we can determine, approximately, the wing area simply by



1. Unique variable thrust design

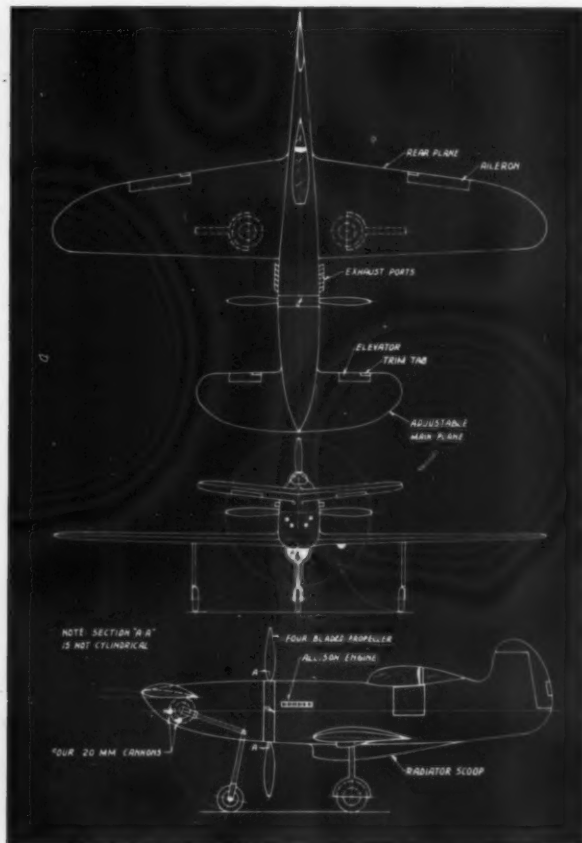
dividing gross weight by wing loading. For example: if our light bomber is to weigh 25,650 pounds with a wing loading of 41 lb.-sq. ft., we need approximately 625 square feet of wing area. With an aspect ratio of approximately 6, using the formula: $\frac{\text{Span}^2}{\text{Area}}$ —we determine the wing span at about 61 ft.

span at about 61 ft.

(Continued on page 41)



2. Bob Thain's original canard design fighter



3. A design for fuselage mounted propeller

CURTISS WARHAWK



Detail layout scale plans for this famous Army pursuit plane

by **WILLIAM A. WYLAM**

THE Curtiss Warhawk is the latest in the longest unbroken line of single-seat fighter planes in the United States. Starting with the Curtiss Hawk PW-8 of 1923, each successive model has brought more speed, faster climb and better maneuverability. In this war more Curtiss Hawk pursuits have been built than any other single type, 10,000 having been completed and more still to come.

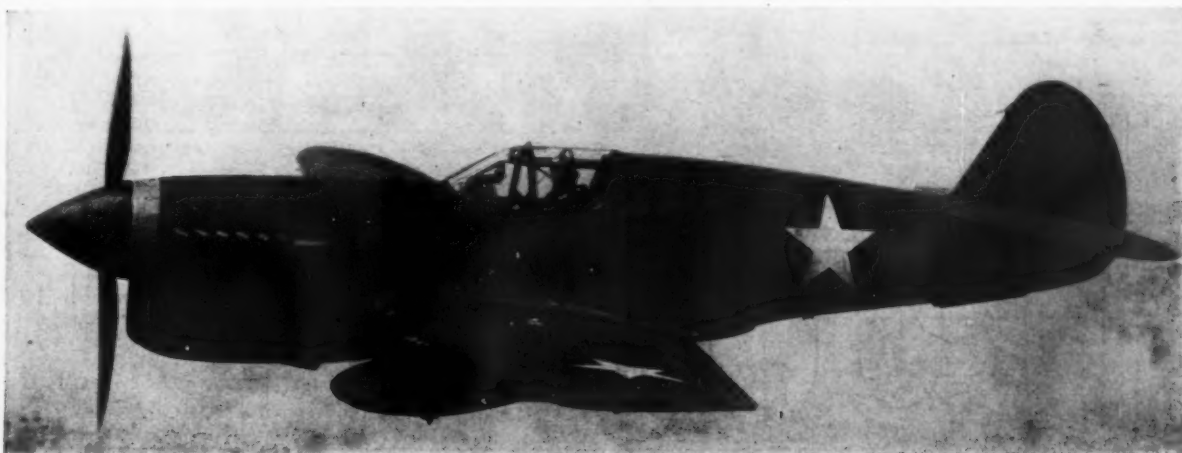
The P-40 has been the subject of disapproving publicity through the past year, largely in circles with little knowledge of its capacities or limitations. Its record, however, stands as its best defense. With the P-40 General Chennault's Flying Tigers gained fame as the

single aerial obstacle in the path of the Japanese Air Force over China. With the P-40, wearing both British and American insignia, the Allies in North Africa were able to push General Rommel and the Nazi *Afrika Korps* across 1500 miles of bitterly contested desert, drive him into the Mediterranean and attack him again in Sicily. With the P-40, the Japs were harassed in the Aleutians, finally forced to evacuate.

Although still in service the world around, the P-40 is now in wide use as a tactical instruction type, a workhorse preparing pilots for their grueling duties aboard the newer and superior high-altitude *Thunderbolts* and *Lightnings*.

Our detail layout includes both the *Warhawk* and the *Kittyhawk*. Essentially the same airplane, the two differ in that the P-40D *Kittyhawk* is powered by an Allison V-1710-39 liquid-cooled engine developing 1,300 horsepower whereas the P-40F *Warhawk* is powered by the Packard-built Rollys-Royce *Merlin* liquid-cooled engine developing 1,280 horsepower. The external difference between these two models is the removal of the carburetor air scoop (long duct on upper cowl of P-40D) in the P-40F which is unnecessary for the up-draft carburetor of the *Merlin*.

VICTORY



ADVISORY BOARD

Answers to model design questions by our readers

APPARENTLY there is no end to questions that men can ask about aviation; there always seems to be some new problem to solve. In fact this is what makes this science so interesting. We regret we have not space to print all the questions received, however, we will answer a few typical and outstanding ones that may be of help to many model fans.

Charles Brown of 227 Gill Avenue, Biloxi, Mississippi, writes and asks:

QUESTION: What diameter propeller should be used for a stick model with a wing span of $31\frac{1}{2}$ " and length of 22? Also how much dihedral and power should be used?

ANSWER: Mr. Brown does not state whether the stick model is for hand launching or ROG (Rise off Ground); this makes considerable difference. We assume he refers to a single propeller "tractor." If it is the hand launching type we advise a smaller propeller than in ROG types because the HL type is the most unstable, and because of its long nose the propeller gyroscopic action has greater effect, producing still greater instability. The art of hand-launched stick model building is to design the model so stably that a propeller of maximum diameter can be used, though for practice or sport propellers of relatively smaller diameter are advisable.

For hand-launched stick-sport models the propeller should be $\frac{1}{4}$ the wingspan, in this case between 10" and 11"; for contest models diameter should be between 40% and 45% of the wingspan. Excellent results are obtained on the latter if wings of very high aspect ratio are used, for instance 10. For ROG models the diameter may be $\frac{1}{2}$ the wingspan for contest work and about 35% the span for sport models.

The amount of dihedral required varies with the type of model. For sport flying dihedral is large to insure excess stability; for instance, each wing tip raised $1\frac{1}{2}$ " per foot of span. In this case the span is about $2\frac{1}{2}$ " so each wing tip is raised $3\frac{3}{4}$ " above the center rib chordline. For greater efficiency in contest models dihedral is 1" per foot of span, in this case $2\frac{1}{2}$ ".

Mr. Brown did not give sufficient data for us to precisely answer his question concerning power. Power required is determined by the model's weight, propeller diameter and pitch, and wing area. Approximate power required for any model is four strands of $\frac{1}{8}$ " flat rubber per ounce of model when the propeller is $\frac{1}{4}$ the wing span. For greater diameters rubber should be added proportionately. For instance, if diameter is 15" instead of 10", 50% more rubber is used.

Lew Wallace of 1103 South First Street, Neptune Beach, Florida wishes an answer to the following question:

QUESTION: How does a dethermalizer function and what does it look like?

ANSWER: A dethermalizer is an air-brake applied to a model plane to increase its sinking speed and kill the glide so thermal currents will not carry the plane aloft and out of sight. A dethermalizer is very easy to make. Any flat surface attached to the plane perpendicular to the line of flight will cause drag. Thus the drag is increased, and lift-drag ratio decreased. Glide is proportional to this ratio and is measured by it; so if drag is made greater relative to lift by a dethermalizer the model glides more steeply. In other words, sinking speed is increased, flying speed remaining the same. Knowing the purpose of a dethermalizer it is easy to design one: there are many kinds. Some take the form of trailing edge flaps, here the trailing edge is hinged so that in normal flight they are up in normal position. At a given time, controlled by a timer, these hinged trailing edges are pushed down into a vertical position. This produces increased drag and the model settles.

Other dethermalizers take the form of panels, forming a part of the upper wing surface when in normal flight. When it is desired to slow down the model the dethermalizers are raised to a vertical position, breaking the airflow over the wing upper surface and killing the lift. At the same time drag is increased.

These flaps need not be very large. On models with 3' span two flaps would be used, one on each wing, each about 8" long and 1-1/4" high. Any other device which accomplishes this purpose can be used as a dethermalizer.

Carl Goldberg of Chicago uses the stabilizer as a dethermalizer. When the model is to be brought back to earth a catch is released by a timer and the stabilizer trailing edge rises a distance of about 40% of the stabilizer chord, the whole action taking place about pivots at the leading edge. This increases the angle between stabilizer and wing so the wing is constantly in a stalling position. Thus lift is killed and drag is increased.

Peter Nadrowski, Jr. of 75 Elm Street, Holyoke, Massachusetts is puzzled about:

QUESTION: How do you determine the center of pressure on a tapered wing?

ANSWER: First find the center of pressure of each wing half, right and left. Normally the c.p. does not remain in one position during flight; it moves forward and backward. The limit of forward motion on most wings is a point at a distance equal to 25% the chord length from the wing leading edge. The limit of rearward motion is about 50% of the chord from the leading point. At low angles the center of pressure is at the 50% point, at high angles of attack it moves forward to the 25% point.

For practical purposes the c.p. is generally assumed to be at the 33% point, its position throughout average flight angles. Knowing this we can calculate its position on the tapered wing. If leading and trailing edges are straight, merely mark a point on the short tip rib $\frac{1}{3}$ the chord from the leading edge. Then mark a similar point on the root or center rib. The center of pressure of the wing lies on a line connecting these two points. To find its exact position on the line, cut out a cardboard pattern to the exact wing outline and find the point at which it balances. This is the wing center of area. Draw a chord line perpendicular to the span through this point. Also draw the line on the cardboard connecting the two center of pressure points of the wing. The intersection of these two lines is the center of pressure, provided lift on wings is equal throughout their span.

Lift on a straight wing is greater at the center than toward the tips. The center of lift figured span-wise is at a point approximately 40% the half-span from wing center toward the tip.

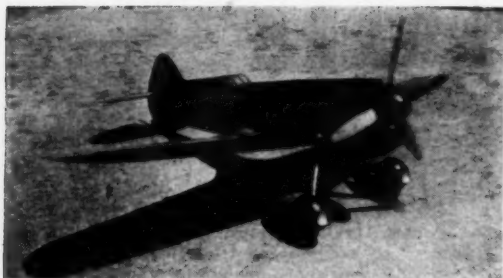
On a tapered wing the center of lift is at a point $\frac{4}{5}$ the distance from the wing center to its center or area, measured from the center of the wing outward along the line connecting the center of pressure of the tip and center ribs. So on your cardboard pattern measure out along the spanwise line marking a point at $\frac{4}{5}$ the distance between the center rib and line passing through the center of area. This point will be the center of lift of one wing. The center of lift on the other wing will be in the same relative position. The center of lift on the whole wing will be at the center of the wing on a line connecting the centers of lift of the two half wings.

The problem is similar for elliptic or irregular shape wings with curved leading and trailing edges. However, instead of merely finding the c.p. of the tip and root rib and connecting the two with a line, the c.p. of each rib along the span must be found. That is, a point must be marked on each rib $\frac{1}{3}$ of its chord length back from the leading edge. Then the center of pressure will be on a line passing through these points. This line in most cases will be curved. The rest of the procedure is similar to tapered wings with straight leading and tapered edges.

QUESTION: On a U-control model is the center of pressure and the center of gravity made to coincide?

ANSWER: These two coincide only during certain phases of flight because the center of pressure moves backward and forward with any change in angle of attack. The only fixed factor is the center of gravity, which on U-control models is usually placed well forward. If placed at the $\frac{1}{3}$ point the model has a tendency

(Continued on page 40)



Geo. Stevenson's U-control with landing lights



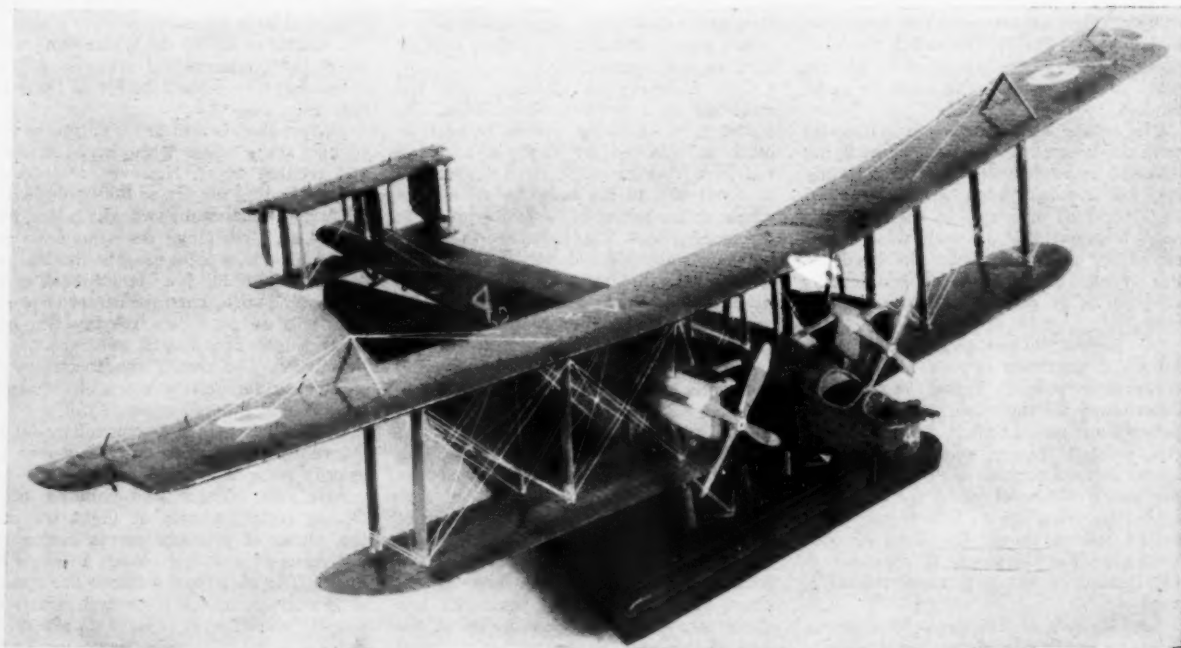
Fokker Triplane by Richard Campbell



Pete Demma's model Curtiss Hawk P-6E



News of model plane experimenters from all parts of the world



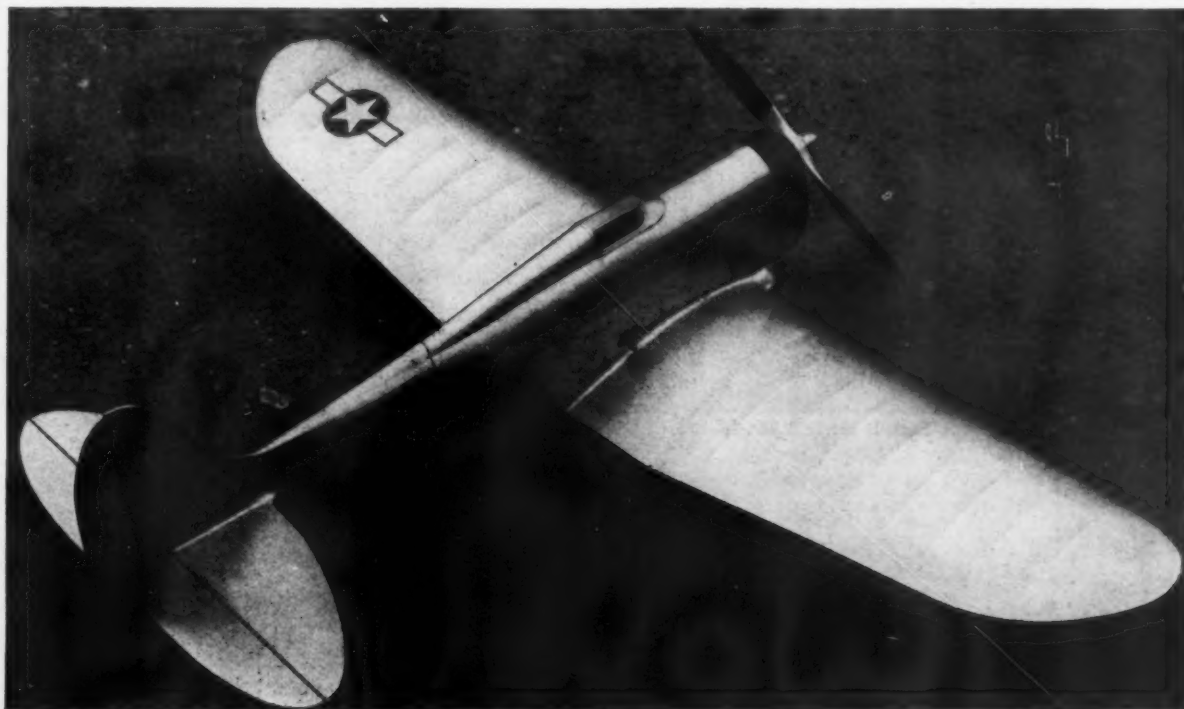
Californian Don Becker spent one month on this amazingly detailed Handley-Page bomber



Sting Ray by Johnny Clemens of Dallas, Texas, has enlarged wing, improving glide and maneuverability —



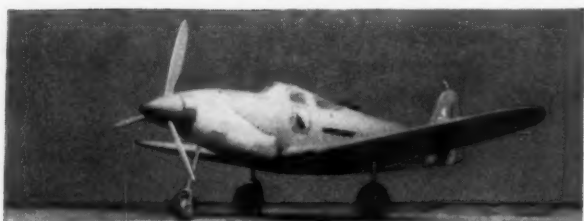
Alan Walker spent 40 hours on this hardwood model of Avenger A gas model Curtiss Hawk single-seat pursuit by W. Boye Hagerty



An original design control line ship by George Moon with 52" span and retractable landing gear



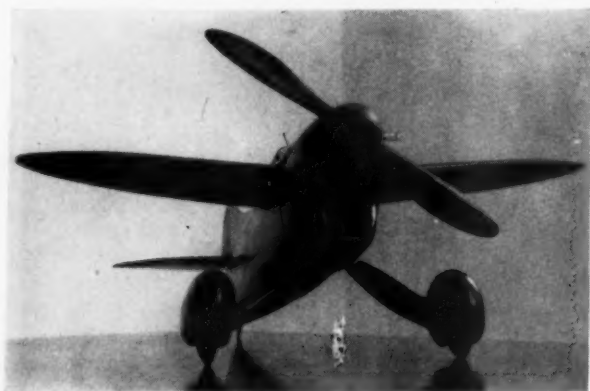
An amazing Hawker Typhoon control line fighter with 30" span by Joe Torpey



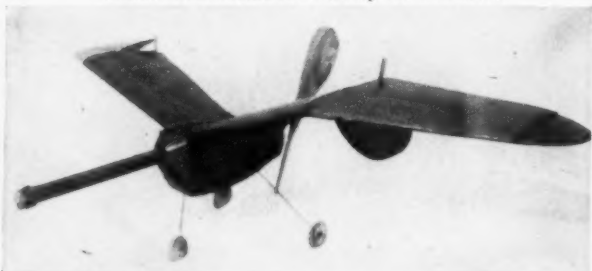
Clayton Sherry's $\frac{3}{4}$ " scale Bell Airacobra



Detail scale Lockheed P-38 by Ivan Dunton



The Fury by J. S. Luck is original design



Experimental flying wing designed by Ken Preston



Two detailed scale models by Bob Harder with glossy finish. Note excellent photography



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- X-4... Douglas 8A5
- X-5... Vought "Corsair"
- X-6... Lockheed "Lightning"
- X-7... Grumman "Wildcat"
- X-8... Grumman "Skyrocket"
- X-9... Westland "Lysander"
- X-10... Focke-Wulf
- X-11... Henschel
- X-12... Fairchild Trainer

Regarded as one of the most aerodynamically advanced aircraft lately developed in America, the "Mustang" is one of the greatest single-engine fighters with the long range, speed and fire-power required for battering Hitler's "European fort." As a cooperation plane on daylight sweeps, it is a powerful ally of the heavy bomber, and has been in extensive use by the R.A.F.

Every model builder who seeks to keep "right up to the minute" on the very latest developments in warplanes will want to build this Megow model of the great "Mustang." Its lines are extremely interesting and authentic, and it is an exceptionally good flier. The 30-inch wingspan is impressive in appearance, easy and practical to construct, and the design is according to Megow's VICTORY CONSTRUCTION methods.

The "Mustang" model is the thirteenth member of the famous "X" line of Megow warplanes, all priced at 95c each. For the complete list, see adjoining column. See them at your dealer's, or order direct from us, if he cannot supply you.

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of model makers. Its super-
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blades (just re-blade to
re-sharpen) and the sci-
entifically shaped blades
in great variety, give the
craftsman the most ver-
satile tools of his whole
outfit. With these amaz-
ing knives, you increase
output and improve ac-
curacy 2 to 1.

KIT NO. 62—
Double set with 2
handles, 12
blades... \$2.00

KIT NO. 82—
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handles, 12 blades
and fitted
wooden chest... \$3.50



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To Build Model Planes" ☐ Enclosed find \$2.00—
X-ACTO desired: ☐ Kit No. 62—\$2.00 ☐ Kit No. 82—\$3.50
☐ No. 1 (light)—with one blade 50c. ☐ No. 51—with 5 extra
assorted blades \$1.00. ☐ No. 3 (heavy)—with one blade 50c.
☐ I will pay postman \$... plus postage
(NO C.O.D.'s ON 50c ORDERS.) Save postage and
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ADDRESS.....
CITY..... STATE.....
NOTE: If you live outside of U.S.A., send money order in U.S. funds

Torpedo!

(Continued from page 7)

signer in the matter of dimensions, wing loading and landing speed.

In the present war the torpedo plane has proved a far more successful weapon against the battleship than the dive bomber, even though the planes scoring early victories were mostly out-of-date design, slow, unwieldy and unable to protect themselves.

The first test of strength between torpedo plane and battleship came on November 11th, 1940. Units of the Italian Fleet at the time far outweighed British units in the Mediterranean, including the battleship Littorio and two others, were moored in Taranto Harbor. During the night Fairey Swordfish, from the British carriers Illustrious and Eagle, attacked the harbor in successive waves. When dawn cleared the scene, the Littorio was torpedoed, as were the other two battleships; one was sunk and two cruisers and two auxiliary vessels had been damaged.

Just two weeks later on November 27th, 1940 the British Fleet, under Admiral Somerville, sighted the new Italian battleship Vittorio Veneto in company with six cruisers and several destroyers off the coast of Sardinia. Admiral Somerville moved to attack but the faster Italian vessels sped into the distance. However, Fairey Albacore torpedo planes took off from the Ark Royal and overtook the Italians, one torpedo striking the Vittorio Veneto and a cruiser being hit.

On March 28th, 1941 torpedo planes from the formidable spotted a strong Italian fleet, including the elusive Vittorio Veneto, eight cruisers and eight destroyers off Cape Matapan, Greece. Against the British gave chase and the Italians outdistanced them. A torpedo plane attack was launched and the Vittorio Veneto was hit, slowing it to a speed of only 10 or 12 knots. This forced the whole fleet to slow, to stay within protection of the battleship's big guns and that night the British Fleet moved in and sunk three cruisers and two destroyers.

The slow old Albacores were not alone in the action however. From the African Coast came squadrons of deadly Bristol Beauforts, cousin of the Blenheim bomber and staminate of the Beaufighter. The land-based Beauforts made a glorious debut smashing their 2000 lb. tin-fish into the hulls of the Italian fleet fighting off the feeble air cover put up by the Italians.

The same ancient Swordfish flying from the aircraft carrier Ark Royal launched the torpedoes that crippled the German battleship Bismarck on May 27, 1941 trying to escape from mid-Atlantic after sinking the British battleship Hood.

On the other side of the world forty very ancient Japanese bombers and torpedo planes sank the British battleship Prince of Wales and the battle cruiser Repulse in 1-1/2 hours on December 10th, 1941 off Malaya. In the Indian Ocean the Hermes and two British cruisers were sunk by presumably land-based Japanese torpedo planes.

A twin-engine Italian Fiat BR torpedo bomber similarly hit the great British

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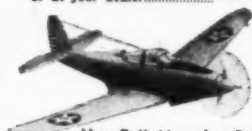
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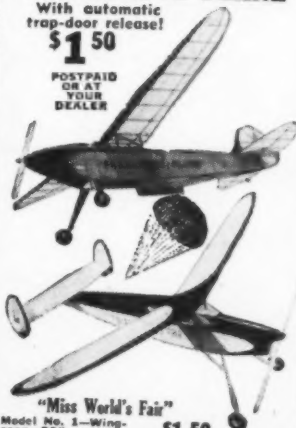
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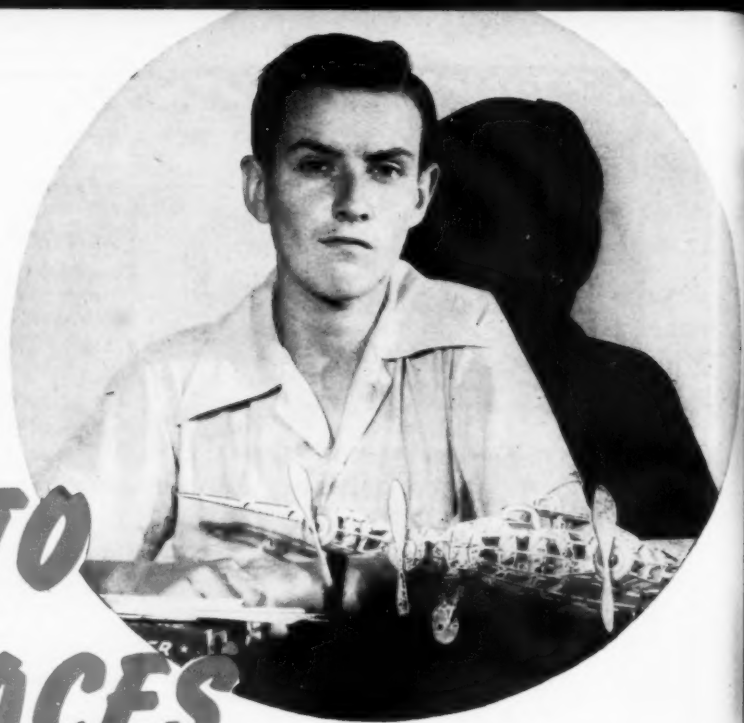
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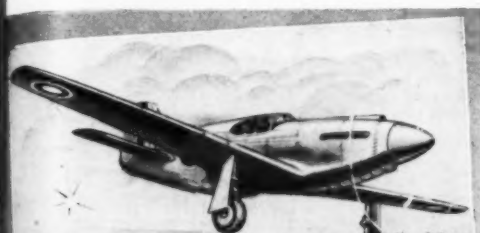
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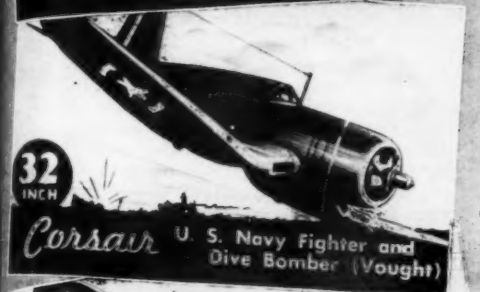
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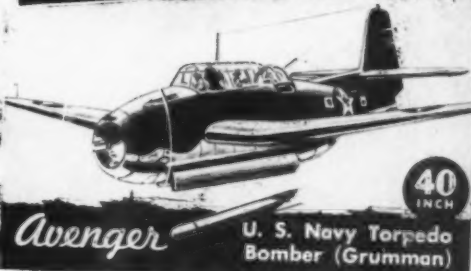
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GAS MODEL ACCESSORIES

Champion Spark Plugs 1/4 or 1/2 50c

Plugs or Tip Jacks..... 15c
3 plugs and field jack..... Special 35c

Battery Boxes, Sm., Med..... 40c
Motor Mts. sm. 15c; Med. 20c; Metal 35c

Condensers, best qual. 20c; Metal 35c
Terminal Clips 1/2" 10c val. 2-8c

Soaphetti Tubing 1/16" 3 ft.—10c
Toggle Switch 35c, Lightweight 35c

SAE 70 oil—1/2 pt. 35c; Pint. 50c
High Tension Leads—Best..... 15c

Best Quality M.T. leadwire, 3 ft.—10c
Booster Leads, 75c value, pair..... 50c

Solid DURAL Spinner, Small, Lge. 25c
Masking tape—1/2" x 36"—Instruc. 10c

Alligator Clips—Solderless..... 10c
Jiffy Switches, stops power draws 35c

Neoprene tubing per foot..... 20c
Plywood—1/16, 1/8, 3/16, 1/4, 1/2, 3/4, 1" 40c ft.

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1/8x8..... 2c
1/16x8..... 1c

ALUM. TUB 1/8" 10c

1/16" 10c

Sheet Alum. 1/8" 10c

0.005-.005..... 10c

0.010..... 10c

1/16" x 1/8" 10c

Alum. Duraling 1/8" 10c

1/16" 10c

CAMEL'S HAIR BRUSHES

Med. Sc. Lge. 10c

1/16" 10c

MUSIC WIRE

1/16" 10c

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little protection against attacking fighter planes, or armor, the task was often suicidal, but results were more than considered worthwhile.

Torpedoes vary in size but the standard 17" aircraft type weighs 1100 lbs. In modern torpedo bombers they are carried in enclosed bomb bays so arranged that the torpedo drops clear of the air-plane propellers. The torpedo is fired by a "war-head" or detonating fuse in the nose, containing 500 lbs. of TNT. This is "armed" by the pilot before making his attack. Once in the water which it enters at a speed varying from 40 to 50 knots, the torpedo is controlled by its compressed air motor, and behaves in every way the same as the torpedo fired from a surface vessel.

In going down to attack the torpedo plane must cope with enemy fighters at attack, and is liable to concentrated fire of small and heavy caliber machine-gun and pom-pom fire. Defense against enemy fighters is usually provided by fighter-planes of the air-group to which the torpedo squadron is attached. Without such defense the work is extremely hazardous, shown by the fate which befell the U. S. Navy squadron Torpedo Eight of which only one member survived. These Dauntless dive bombers were under-armed and ill-equipped to defend themselves. New torpedo bombers, such as the Grumman Avenger, are heavily armed and armored and have such speed that once they launch their torpedoes they are themselves a match for the average shipboard fighter both in fire-power, climb and maneuverability.

With the fitting of power turrets for the back-seat men, the modern torpedo plane can defend itself while the pilot is making his run in for the attack. It is absolutely essential for the plane to be in normal flight position when the torpedo is released. If the plane is diving the torpedo noses down and comes out of its dive in the reverse direction. If climbing the missile would "porpoise" along the surface and lose direction. The aim of the pilot is to drop his torpedo at about 100 feet above the surface. At the moment of releasing the tin-fish the pilot opens his flaps to check the plane's speed and then uses the open flaps to speed his climb. A Beaufort pilot told us he could bring his machine almost to a dead stop from 300 mph using the flaps, and then escape in a steep climb.

The torpedo is set to run on a straight course fifteen or thirty feet below the seas surface, and thus strike the target at one of its most vulnerable spots beneath the water line where water pressure helps to hold the explosion in, so that it exerts full pressure against the hull. The purpose of torpedo attack is not so much to deliver one crushing blow to destroy the battleship as is done by the huge 21" 2000 lb. torpedoes carried by submarines or destroyers, but to keep delivering a series of attacks from all quarters, so the vessel is sorely "wounded" in several places.

Two methods of attack are in general use. A squadron of planes can attack ships in echelon, coming in on the target

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Torpedo!

(Continued from page 30)

erably to shatter the Japanese armada, and proved conclusively the land-based torpedo plane definitely "had something".

Later in Alaska when the Navy PBV Catalina spotted the Jap fleet consisting of a battleship, an aircraft carrier and several cruisers and smaller vessels, the Marauder pilots did the same thing with good results. In both instances these planes' range and striking power contributed largely to the enemy's defeat. From the Australian front come other reports of successful land-based torpedo Beauforts, Bostons and Banshees, army version of the Douglas Dauntless. Similarly Catalinas with their astonishing 4000 miles range have been pressed into service as torpedo planes in the Aleutians, South Pacific and Atlantic areas.

Torpedo bombing is dangerous work. The bomber must fly in low, sight his plane on the target, and hold it level till he presses the trigger releasing the torpedo. In the old-fashioned planes with



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AND OTHER MATTERS. — Barney

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Detroit 7, Mich.

with ample space to allow planes to break away, and strung out at sufficient distance to prevent defending guns from enfilading the attackers.

This attack is delivered forward of the beam so the ship presents the largest possible target. Sometimes the attack is delivered by a formation of planes flying in a semi-circle converging on the bow and both beams of the ship. The planes fly in from all angles and release their torpedoes at that range. Whichever way the ship turns there is little chance of avoiding all the missiles.

Sometimes a double attack is delivered. Two sections of planes move in towards the ship from port and starboard. They fly at approximately 90 degrees apart, each arriving in releasing position at intervals of 30 seconds or a minute apart. If the captain of the ship under attack maneuvers his vessel parallel to the path of one torpedo he puts it broadside to another coming from another angle. With planes coming from all directions the ship's gunners are unable to concentrate their fire around the entire circle of attack.

Sometimes a smokescreen is laid down on the water near the ships to be attacked. This screens the planes as they

come into attack, but in no way obstructs the pilots' view, who move in behind the screen, rising above it if necessary to line their planes on the target.

Even under such conditions the torpedo plane is vulnerable to the increasing amount of anti-aircraft fire carried by the modern battleship and aircraft carrier. The ideal attack method is to combine assault of torpedo bombers with an attack by horizontal or dive bombers.

(Continued on page 38)

The Vampire

(Continued from page 9)

3-5/8" dihedral at each tip.

Stabilizer outlines are constructed from either 1/8" or 3/16" sheet with 1/16" sheet ribs and spar. The spar tapers from 3/8" at the center to 1/8" at the tips. First cement the outlines and spar in place and glue the pieces of 1/16" sheet in place. These are then cut and sanded to an airfoil shape as shown on the plans. The rudder construction is similar to that of the stabilizer, using 3/16" sheet outlines throughout and also using 1/16" sheet for ribs and spar.

COVERING AND ASSEMBLY: Before covering the fuselage, install the ignition system, using the wiring diagram shown on the plans. Be sure to make a neat job of this part because the model's performance under power is greatly affected by this factor. Keep all wires as short as possible and solder all the connections firmly, using a minimum of solder.

Cover parts with any good grade of Silkspan, bamboo paper or silk. Before covering it is advisable to have all framework parts which come in contact with the covering well sanded to make sure there are no rough spots to ruin the model's finish. Spray the entire model when covered with a fine mist of water; when dry give it three coats of colored dope and one or two of clear. Cement the celluloid windows and windshield in place, using pins if necessary to hold it in position until the glue has dried.

Cement the stabilizer in its slot and the rudder to its position on top of the fuselage. Block these up to assure correct alignment. Hold the wing in place by looping rubber bands around the rear dowels, over the wing and around the front dowel. With this arrangement the wing is permitted to "fly off" in case of a crackup, thus helping to prevent damage to the model. Add the decorations and final "touching up" and the model is ready for flight.

FLYING: Before flying the model under power try some shoulder high glides over a patch of deep grass. Adjust the glide by shifting the battery box or adjusting the wing angle of incidence. When the glide proves satisfactory try a few flights with the engine running slowly. Gradually increase speed of the motor on each flight until maximum performance is attained. If a careful, conscientious job of construction is done, the builder will be rewarded with many hours of pleasure while flying his Vampire.

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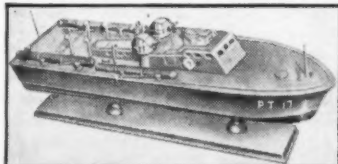
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Torpedo!

(Continued from page 36)

This diverts enemy fire to the upper skies and gives the torpedo bomber a better chance to get in close to attack. Under ideal conditions fighter planes that have escorted torpedo planes to the target strafe the ship's gun crews, and slay or drive them to cover by concentrated fire of their 50 caliber machine guns, while the torpedo planes attack.

Its success against the heavily armored battleship has caused experts to give more and more attention to the aerial torpedo. Success of the three-seater Grumman Avenger, a fast heavily armed torpedo bomber, has more than justified the confidence of the torpedo plane enthusiasts.

In the speedy, well armored and heavily armed Avenger, say the experts, there lies the pattern for the super land-based, torpedo bomber which will have to be used against the Japanese fleet in the forthcoming naval showdown in the Pacific. A carrier-based torpedo plane is handicapped by design limitations such as folding wings, landing speed and fuel weight; land-based counterparts are free from such limitations. Give it sufficient range and it will prove the most effective weapon airpower can use against the battleship.

The Germans seem to be well awake to the possibilities of the big torpedo bomber. A British aviation journal recently stated that not only their all-rounder, the Dornier 217, can be used as a torpedo

bomber, but the four-engine Heinkel 177 is designed to use torpedoes on long-range ocean raids. In fact, the Germans, preparing for a defensive war, seem to put a great deal of faith in the aerial torpedo, following successes of their torpedo carrying Heinkel 115s against our convoys on the North Atlantic route. The Germans, say the British, made a big mistake in not using torpedoes on their Kuriers and Condors with which they made futile attempts to harrass shipping on the Atlantic routes.

The Germans may have learned a great deal about torpedo planes from their ex-allies, the Italians, who highly developed this form of attack. At the time Mussolini decided to enter the war the Regia Aeronautica had six types of torpedo planes, some of them excellent designs. The Italians have always been excellent aircraft designers, but shortage of materials and lack of pilot training combined to render their planes ineffective. Notable among land-based torpedo bombers were the Cant. Z.508, a tri-motored seaplane with a top speed exceeding 250 mph, and the Cant. Z.1007, a well designed tri-motor credited with being capable of a speed approaching 300 mph.

Another tri-motor held by some authorities as best of the Italian torpedo-bombers was the Savoia-Marchetti SM.83 tri-motor with a range of 1000 miles and a maximum speed of 270. The latest addition to the S-M family was the SM.85, a unique one man bi-motored torpedo bomber with a speed of 330 mph and a

(Continued on page 56)

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SEE PAGE 49

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Advisory Board

(Continued from page 25)

to nose up at high speed, so the c.g. is commonly placed at the point of maximum forward travel of the c.p.; that is, 25% the chord length back from the leading edge.

QUESTION: Is the stabilizer set at neutral angle and is the correct wing angle of incidence 3°?

ANSWER: The stabilizer usually is set neutral; that is, parallel to the thrust line. The wing angle of incidence commonly is not more than 1 or 1-1/2°. Three degrees is excessive and gives the model a tendency to nose upward. This is due to the extremely high speed at which U-control models fly. The rule is: when speed is high, angular difference (longitudinal dihedral) between wing and stabilizer is small. At very slow speeds it can be as large as 4° and at medium speeds 2-1/2°.

LaVerne H. Rothman of 702 East Third Street, Monroe, Michigan evidently senses a difference in performance with flat and

cambered stabilizers and in this he is quite right, he asks:

QUESTION: How does the area of a cambered stabilizer compare with the area of a flat one and how much less area can be used with a Clark Y section?

ANSWER: When flat stabilizers are used, in average cases, their area is equal 1/3 the wing area, as a minimum. They may be as large as 40% the wing area without causing loss of efficiency. Naturally stability is increased with greater area. When cambered sections are used for stabilizers the area can be 20 to 25% less. With a Clark Y section area should be 20% less.

QUESTION: On what line of a tapered wing do you figure the dihedral: top, bottom or chord line?

ANSWER: Dihedral is always figured from a spanwise line passing through the chords of each rib section.

If you have a question puzzling you do not fail to send it to the Advisory Board Editor. We will answer it as promptly as possible.

VICTORY

Design Forum

(Continued from page 21)

By the same method we can determine approximate horsepower. The fighter has a power loading, lowest of all, of 5 to 7 lb./hp.; the light bomber, 7 to 9 lb./hp., and the heavy bomber 9 to 12 lb./hp. By dividing gross weight by power loading we find the horsepower necessary. For example: in our light bomber, we will need about 3200 hp. If available, a single engine of this horsepower, or thereabouts, is used. Since there is none in quantity production, it is necessary to use two engines of about 1600 hp. each. The Wright double-row radial engine develops this horsepower; thus we specify two of these.

The amount of fuel required is determined by the range desired. The modern radial engine has a specific fuel consumption of from .45 to .65 pounds of fuel per horsepower per hour. If we want our plane to fly a certain distance, we divide this distance by the expected cruising speed, giving an answer in terms of hours. We then multiply these hours by the cruising horsepower of all the engines and then by the specific fuel consumption and obtain the total weight of fuel necessary. This must then be divided by a figure of about six pounds (weight of a gallon of gasoline) and we get the total number of gallons desired.

For instance: Our medium bomber must have a cruising range of 2400 miles. At a cruising speed of about 290 miles per hour, it takes about 8 hours. Since our engines develop about 2,000 horsepower (total for the two) at cruising rpm, and have a consumption of .48 lb./hp./hr., we require approximately 1,280 gallons of fuel. The quantity of oil will be about one-eleventh of this, or 115 gallons.

We can now recapitulate our preliminary weight estimate and add up what we have to see how we stand. We have two powerplant systems in our mythical medium bomber, weighing about 1,850 pounds each, or 3,700 pounds in all. Our fuel weighs 7,650 pounds and oil 1,035 pounds. This adds up to about 12,385 pounds for the powerplant system. Constituting one-fourth the gross weight, it indicates an airplane weighing in the neighborhood of 50,000 pounds, or twice that we planned. Obviously, at the gross weight selected our airplane cannot have the range desired, so we cut it in half, or 1200 miles.

Running hurriedly through our calculations again, we see that a fuel load of about 640 gallons and an oil load of 57 gallons gives a weight of 3,840 for fuel and an oil load of 513 pounds, or a total powerplant weight of 8,053 pounds. Multiplied by four gives a gross weight in the general region of our preliminary guess. Being larger, however, either our wing-loading must go up, requiring heavy structure, or we have to increase the wing area.

Thus, from this very cursory approximate analysis it becomes quite clear that the airplane's design is a cut and try procedure. As has been shown, we must start with something by taking a wild

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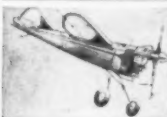
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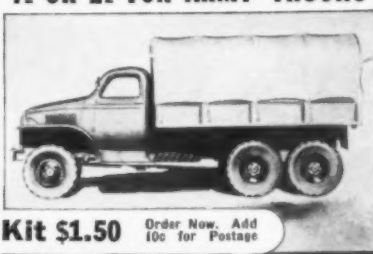
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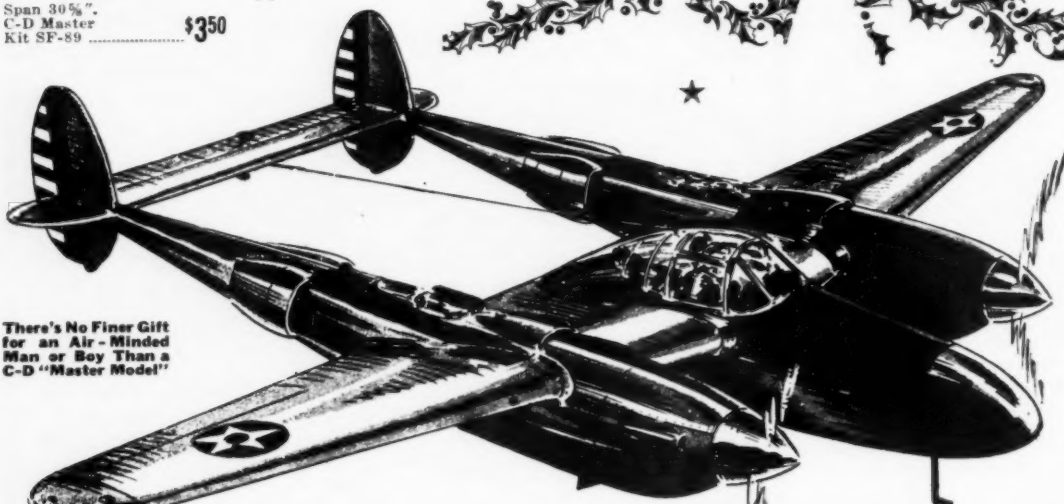
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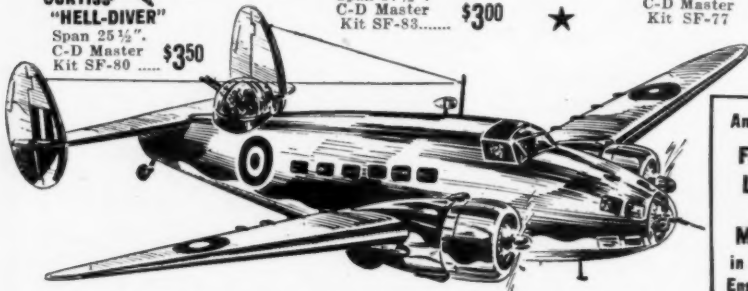
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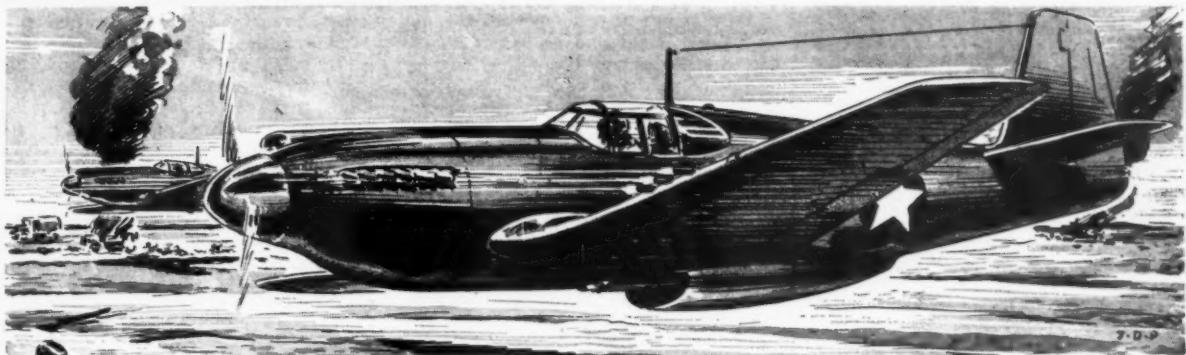
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guess at the machine's weight and size. Later, as our design analysis progresses, we begin to carve away here and add there until, after considerable compromise, we arrive at the airplane's final dimensions, weight and equipment. Perhaps the reader now has a clearer grasp of the complexity of airplane design but, at the same time, now has some rough tools with which to work. By following the above procedure you can quickly analyze the major faults in your design.

Why not try this procedure on your own design to learn for yourself its practicability and eliminate the more obvious errors in conception?

Design No. 1 comes from Calvia Okagaki in Wyoming. It shows his unique amphibian featuring a mechanism by which the propeller shafts may be raised for water operation and lowered for flight. The mechanism is clever, complete, practical and an amazingly simple and logical solution to the problem. However, variation of the airplane's thrust line in the amount suggested here introduces a major problem in the trimming of the ship. To raise and lower it the distance proposed in the drawing might easily make the airplane completely unmanageable.

While in flight the airplane would perform quite satisfactorily, but when approach for the water landing is made and propellers are raised, a decided negative pitching moment is introduced, tending to throw the nose of the ship down sharply. To counteract this, the pilot pulls back on the stick, tending to force the

nose up but it would appear this would not completely overcome the tremendous pitching moment extant and the ship would dive into the water. An extremely large elevator is required, together with an adjustable horizontal stabilizer with considerable travel.

By the introduction of these special design problems, as well as inherent longitudinal instability of the design, the purpose of the machine, a simple, pleasure craft, is defeated.

It is recalled that the Germans featured a variable thrust line on the Dornier Do. 26; the rear engines were tilted upwards 10° to raise them clear of the water. However, in this machine the thrust line was changed in direction, rather than in location and the relationship between the center of gravity and the thrust line remained unaltered.

Design No. 2 is the work of Pvt. Robert W. Thain, a student at the Army Air Forces Technical School at Scott Field, Illinois. It shows his original canard design, with the horizontal control surfaces in the nose and the main wing and propeller at the rear. The main objection to the canard type airplane, although several have been flown successfully, is its lack of longitudinal stability. In the conventional airplane the downwash of air from the main wing causes the horizontal stabilizer to be flying at a considerably smaller angle of attack than the main wing; in the majority of planes at a definitely negative angle of attack.

The down load on the tail serves as a stabilizing force against the down load

on the nose caused by the thrust line located above the center of gravity. In the canard, this situation is reversed, with the stabilizer generating a lifting force to counteract the up load on the rear of the machine. When the canard noses up or down there is no inherent stabilizing influence to return it to steady, level flight.

On the conventional airplane, when the main wing approaches the stall, the horizontal surfaces are still generating a lifting force. This tends to right the machine due to the great amount of downwash from the main wing. In the canard, should the main wing stall, the stabilizer, placed forward, will have stalled previously, thereby losing its lift and aggravating the longitudinal unbalance. Directional stability is also impaired in the canard, as is the general efficiency of the main wing, which must operate in highly turbulent air from the forward surfaces. The location of the wheels after retraction is not clear from the drawing but from their general location it would be necessary to fold them laterally. Undoubtedly this airplane could be successfully flown but it could not compare with the conventional fighter in performance or efficiency.

Design No. 3 shows another tail-first type airplane. The above comments apply also to this machine. However, a vertical surface has been used which improves directional stability over Design No. 2. Use of the fuselage propeller detracts from the airplane's general design. Although such propeller installation was used on the successful Gallaudet Navy seaplane in 1915, it is doubtful if such a mechanism could be designed successfully today to take required horsepower, retain fuselage structural strength and be light enough to make it practical. Location of the propeller as shown greatly impairs efficiency as it is forced to work in highly turbulent air. In general, the layout is commendable although control surfaces would have to be enlarged considerably for any degree of success.

VICTORY

Fortieth Anniversary

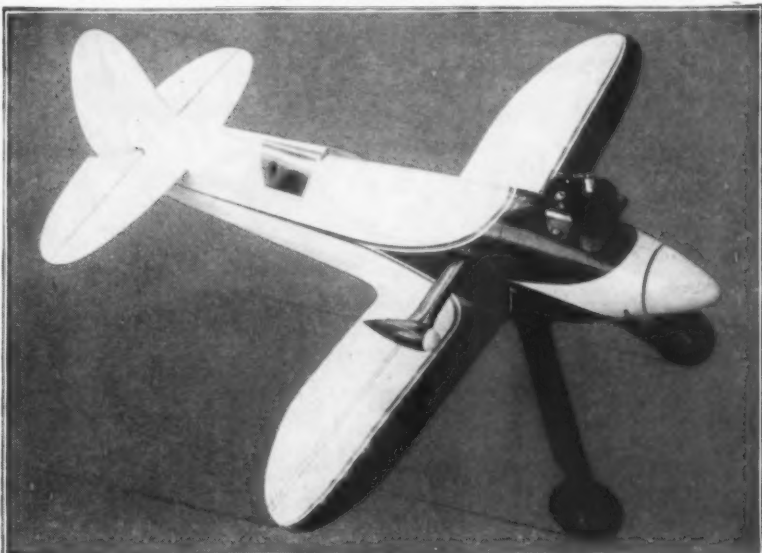
(Continued from page 11)

terest and on December 23rd, 1907, the first set of airplane specifications ever drawn by a government body was issued.

These specifications asked for: "a speed of 40 miles per hour, a flight of not less than one hour's duration, a load of two persons of a total weight of 350 pounds, fuel capacity for a flight of 125 miles and the ability to steer in all directions without difficulty." Four bids were received but only the Wright Brothers possessed the requirements and a contract was signed specifying: "One (1) heavier-than-air flying machine in accordance with Signal Corps Specification No. 486, dated December 23rd, 1907" and "complete delivery shall be made on or before August 28th, 1908." This contract was signed on February 10th, 1908.

On the date specified the machine was delivered and America's air power was born. The following years saw additional

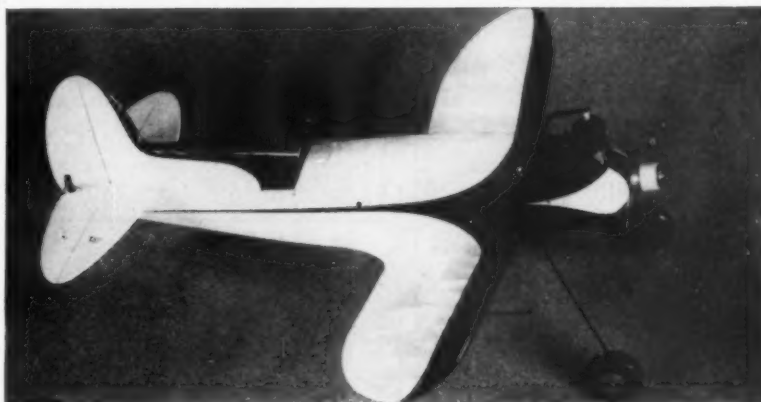
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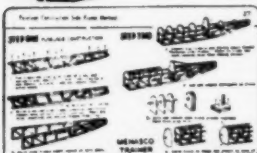
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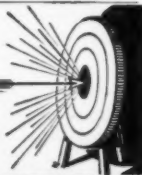


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aviation pioneers hard at work, includ-
ing Glenn Curtiss, Glenn L. Martin, Dr.
Alexander Graham Bell and others. At
the outbreak of the World War on August
1st, 1914, the United States had 16 officers,
77 enlisted men and 8 airplanes. By April
6th, 1917, the U. S. declaration of war
against Germany found us with 3 majors,
9 captains, 33 lieutenants, 458 enlisted
men and 43 student officers in the Signal
Corps with a total of 73 airplanes in ac-
tual service.

The Armistice, November 11th, 1918,
found our Air Service with 45 squadrons
at the front on duty with a total of 740
airplanes. In all a total of 2,698 planes
were in squadron service, of which 667
were of American manufacture. There
were 767 pilots and 481 observers on
active duty.

Twenty-five years later we are again
at war with Germany. In the interim the
U. S. has built more than 100,000 air-
planes, trained more than 2,000,000 Air
Forces officers and men, are now turning
out nearly 8,000 airplanes and 50,000 offi-
cers and men each month.

This is the history of forty years of
growth of the airplane. Planes have flown
470 miles per hour in steady level flight,
more than 750 miles per hour in dives.
They have covered nearly 8,000 miles in
a single flight, have climbed more than
50,000 feet in the air. Airlines in the
U. S. alone have flown more than 4,000,-
000 passengers and covered nearly 140,-
000,000 miles in a single year.

It is admitted many improvements in
speed, load-carrying capacity, and weap-
ons have resulted through war needs.
However, not only the Wright brothers
but all true aviation-minded men look to
the airplane as a peace-loving instrument,
bringing the world closer together and
lending true significance to the word
"brother." The airplane as envisioned by
these men will create a world bound into
one unit through interchange of ideas,
knowledge and respect of individual
rights and needs.

These are the feats of progress in avia-
tion . . . not the ammunition and guns
but scientific developments in high-
altitude protection, instruments for blind-
flying, safety devices to insure oceanic
flights. This is the yardstick by which
aeronautical achievement is to be gauged.

Forty years ago man successfully initi-
ated flight . . . envisioning a closely-knit
understanding world. Instead at present
the airplane is an instrument of despoli-
ation and extermination. However, it will
not be long before the airplane assumes
its rightful role as an instrument of de-
velopment and world-unity.

On May 25th, 1910 Orville and Wilbur
Wright made their first flight together—
and their last—at Dayton, Ohio, their
birthplace. Wilbur Wright died of typhoid
fever, induced by exhaustion over patent
litigations through the years, on May 30th,
1912 at the age of 45.

Orville Wright made his last flight as a
pilot in 1918. Today, at the age of 72, he
lives in Dayton, Ohio, and is still hard
at work on aviation problems, particularly
in research connected with gliders, his
first interest.

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Stuka Dive Bomber



Messerschmitt

Models from Original Plans

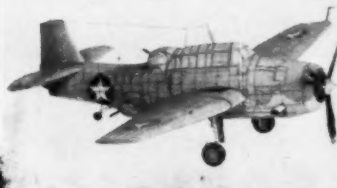
Each of the four models shown above have been scaled down directly from the original construction plans (some have won prizes for nationally-known modellers). . . . Full-size, easy-to-follow plans simplify construction. Clearly printed BALSA sheets. Result—a flying model you'll be proud to show anywhere! **\$1**

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Actual Photo of C-Z Model of the Famous Grumman Avenger

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Boys! These kits will astound you with their "true to life" realism and you will be amazed how easily and quickly you can assemble these perfect scale beauties. Yes, these models are all hollow constructed. They are tougher than balsa and much easier to work. Get next to this new thrill of scale building right now. Stop in at your dealers today and get yourself one or more of the genuine C-Z kits.

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	Curtiss Hell Diver	75c
2 Army Planes	Curtiss P-40-F	50c
	Republic Thunderbolt	50c

STILL AVAILABLE: Many dealers still have on hand the original C-Z metal covered scale model kits. If you hurry you can still build one of these famous kits.

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Dept. M WORTH, ILLINOIS

Flash

(Continued from page 2)

000 gallons of your gas shortage.

SEPARATE AIR FORCE proponents are pleased with the first major step toward their objective, which appeared in the War Department's new field regulations: "Land power and air power are co-equal and interdependent forces; neither is the auxiliary of the other." . . . Consolidated has a 400-passenger transport already in the mockup stage. . . . Allison engine rating has stepped up from a 1325 h.p. in 1941 to a present rating of 1500. . . . Two new super-bombers are on the super-secret list. . . . The twin engine Ju-88s and Me-210s are duck soup for the Thunderbolt. . . . "Whistling Death" is what the sons of heaven call the new Corsair (F4U)—the Buccaneers whistled a symphony of victory with it that sent 68 Nip pilots dancing back to their ancestors. Buccs lost 3. . . . The Hellcat (F6F) clawed a first test victory at Wake Island; Hellcats sixty-one—Zeros zero. . . . Maintenance men, stressing need for design that minimizes and expedites servicing reveal that warplanes spend less than 3% of total time in the air. . . . Important new equipment: A glass fiber reinforced plastic (Owens-Corning Glass) with tenfold impact resistance, shaped without expensive molds, machined easily, and produces a tensile strength of 80,000 lbs./sq.in.

JUAN T. TRIPPE, Pan Am president, urges establishment of a single interna-

tional American airline as a "community company" owned by all U. S. transportation interests under an organization plan approved by the government. Huddled around an air globe at the New York Institute of Aeronautical Sciences, the experts saw a panorama of the near future: All first class mail airborne—300,000 private planes taking off from 6,000 airports—20,000,000 airpassengers annually—new ultra-high frequency radio range eliminating effects of weather, static, etc.—airspace stratified—U. S. planes clicking off 750,000,000 each year. . . . General Arnold's new-bomber discussions indicate that the new Very Long Range (V.L.R.) has a round trip capacity of 10,000 miles—bombload 10 tons. . . . Army Air Forces Training Command, under Lt. Gen. Barton K. Yount, wings 100,000 pilots annually. One-eighth of the entire U. S. Army is in this command, teaching, servicing, instructing and flying 25,000 planes. During September its flying personnel logged 2,338,476 hours with an accident rate of .037 per thousand flying hours as against 1.8 recorded in 1931. This should answer critics alarmed over the "high" mortality of A.A.F. trainees.

WHERE THE Lightning strikes: P-38s have returned to England after a long absence because longer range makes them a more effective bomber escort than the P-47. Lockheed turning to exclusive production of its most famous ship, is determined to double output. Veteran North African pilots, now in China, call the twin-engined, twin-tailed Lightning the greatest fighter in the world—the greatest single engine fighter, though not up to their P-38, they think, is the Me-109. These Jap exterminators are convinced that the Nip's motors are good: of more than a thousand Zeros flying over their territory in the last few months, not one has made a forced landing due to engine trouble. A flight of P-38s, on a 110-mile mission in the South Pacific, carried a 1,000-lb. bomb each—escorted on their bombing mission by Flying Fortresses! Again, when a bomber squadron was grounded for lack of props, P-38s took on the assignment. The auxiliary gas tanks of the Lightnings were used as packing cases and this versatile ship freighted the heavy cargo to its less fortunate, ponderous brothers.

SIXTY BOMBER loss on the Schweinfurt raid is attributed to rocket shells (invented and demonstrated by the U. S. in 1919) lobbed at the Fortresses by Nazi fighters out of range of the bomber's guns. Rockets, while not as accurate as gun projectiles, are heavier, with greater range due to reduced recoil. . . . Enemy has also tried dive bombing on formations with shells exploded by aneroid activated fuses that ignite at set altitudes. . . . "Silver fire" (probably phosphorus) in white disc clusters have been curtailed in front of the formation to set the attackers on fire. . . . Under a new system of bombing, only the bombardier of the leading ship sights on the target—at his signal, all the other ships let go.

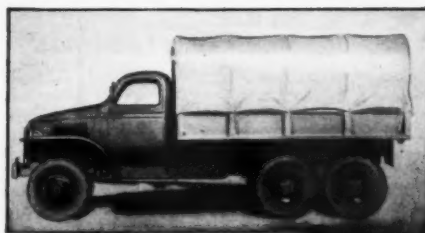
THE REASON the British are loath to release bomb tonnage dropped on their

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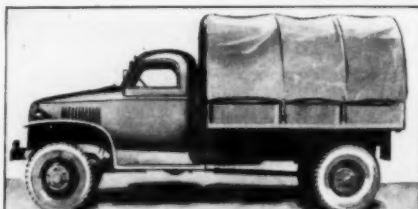
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bility, too! Months of experimenting have produced these qualities in the THUNDERBIRD to a superlative degree. Kit includes all materials with ample supply of covering materials and wood.

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isle in any specified time is to keep Schickelgruber guessing as to how many of his supermen are jettisoning their bombs in the Channel to avoid tangling with the Spitfires. . . . Up to mid-October 32,000 tons of fireworks had been displayed to the Germans by the A.A.F., whose celebrating enthusiasm was not shared by the Heinies. . . . Nips copy tactics of our airfighters until they are letter perfect—then those doublecrossing Yanks pull new ones so that the sons have to start all over again.

W.P.B. RECOMMENDS cut of 10,000 in estimated manpower requirements at North American Dallas plants. . . . Brig. Gen. Hume Peabody has an 8,000 square mile tactical laboratory in Florida where veteran combat pilots try out new, and teach old, lessons learned in flaming skys. . . . Bigger planes than the Mitchell B-25s that hived the Hornet for the Tokio raid will operate regularly from three projected aircraft carriers of 45,000 tons; largest now is the 33,000-ton Saratoga. . . . The long-range, skip-bombing, strafing, anti-submarine B-25 will replace the B-26 on three counts: handles better on only one engine; has lower takeoff and landing speed; simpler maintenance. . . . 100,000 sky beds says physician (Colonel) Randolph Lovelace, who is still parachute jump champ (40,200 feet).

THE AICHI 99 (1200-lb. bombload) has been replaced by a three-place job with internal bombracks for 2,000 lbs., speed

270 m.p.h. at sea level. The new dive-bomber is half again as big as our Dauntless and looks like our Grumman Hellcat. . . . October total toll of Jap planes was 775—not including probables or possibles. . . . A giant German six-motored transport para-glider (Me-323) was shot down in Corsica, starting 112 guttural warriors on their journey to Valhalla. . . . The Nazi answer to the Mosquito, the 400-m.p.h. Me-410 developed from the Me-210, has been proved to be the wrong answer. . . . Conversion of a bomber into a transport is a difficult job, but the British think they have accomplished it with the Avro York, a commercial version of the R.A.F. Lancaster. . . . Eleven-year-old model enthusiast Stanley Davis of Augusta, Me., can identify 600 different planes. . . . The 23-year-old Doering twins, Howard and Harvey, run a production department for Consolidated Vultee Aircraft—building models of the great company's planes for civilian demonstration and military instruction purposes.

THOUGH the overall October average against the Luftwaffe was about 2-1/2 to 1, the Thunderbolts destroyed 77 with a loss of 5, or 15 to 1. . . . The newly-created Fifteenth Air Force will operate in the Mediterranean area under the aegis of the veteran Lt. Gen. Carl A. Spaatz. . . . Frank Piasecki, president of the P-V Engineering Company of Philadelphia, test flew his own 1,000-lb. helicopter with only 14 hours of flying experience. . . . "Round-the-world" aero-engineer Howard Hughes, working with "Wonder-Man" Henry Kaiser, will produce a "Round-the-World Wonder" airplane by the end of 1944, capable of carrying 700 fully-equipped soldiers, or 550 wounded. Authoritative Grover Loeing, W.P.B. aviation expert, declares the ship to be far in advance of anything he has seen. . . . U. S. October plane production, 8,362—German and Japanese papers please copy.

TENTATIVE PLANS, now afoot, call for a record-breaking coast-to-coast hop for the mammoth Lockheed Constellation. Possible crew: veteran coast-to-coasters Howard Hughes and Jack Frye.

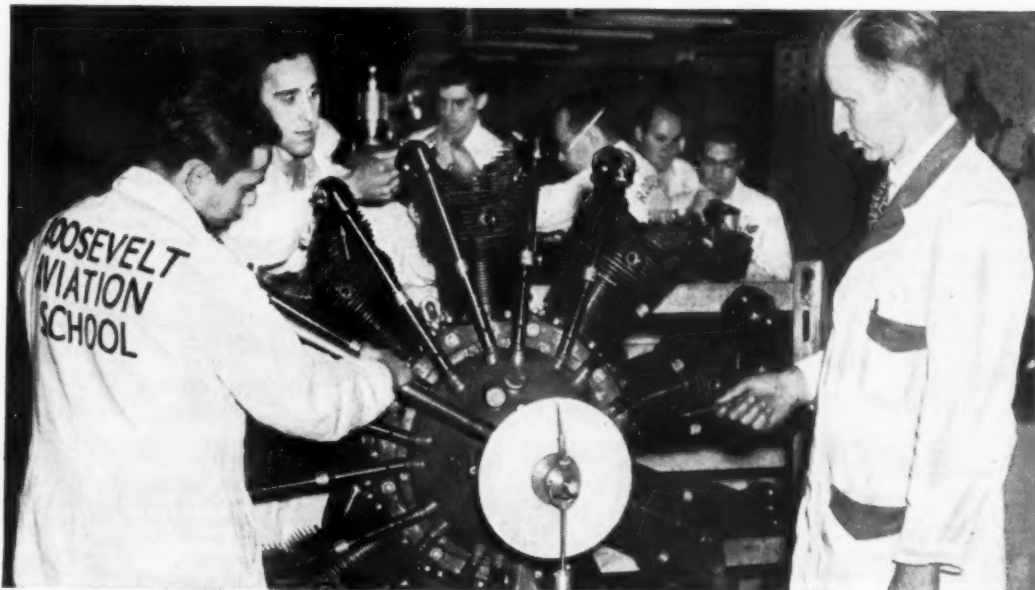
SECRETARY OF NAVY Knox disappointed helicopter fans with statement that none will be used for anti-submarine convoy duty, although Navy has ordered several for experimental work. Heavy AA batteries on new Nazi subs make slow flying helicopters duck soup.

VETERAN adjustable wing designer George Cornelius pops up with still another variation which has been successfully test flown. Idea is adjustable incidence while in flight. New job, largest built to date, has 30-ft. span and is powered by Franklin 130-hp. air-cooled engine. Well-known "Fre-wing" of 10 years ago elicited little interest.

FORTRESS and Liberator now carry wing-tip fuel tanks for increased range. Wonder why these containers are called "Tokyo tanks?"

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● Without mechanics, pilots and bombardiers would be grounded. If you face induction in six months or a year you can spend the time to no greater advantage than by putting yourself in line for a better place in Army or Navy. Many of our graduates have risen rapidly in the Air Corps because of Roosevelt Field training. In addition to pre-induction training, this School offers you sound preparation for a good job after the war in the rising field of Aviation. Every repair shop must have *licensed* mechanics. Other mechanics, no matter what their experience, work under the direction of men who are *licensed*. Graduation from Roosevelt Aviation School automatically entitles you—at age 18—to take the C.A.A. exam for Licensed Airplane Engine Mechanic. Now and after the war these men will be needed.

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2,000 roaring horsepower makes this the fastest navy fighter in the world. Inverted gull wing and long streamlined fuselage make the prototype a beautiful flying model. Watch this ship perform against the Japs.



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30"
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AMERICAN ACE 30"

Those who want the thrill of flying an "Ace" will want to build this streamlined super ship. Rugged construction with wire landing gear, pylon wing mount, and polyhedral wings. It turns in flights just like the world's record gas job.



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Complete drawings show you how to make all the models of the Curtiss P-40 from the XP-40 through the P-40-F. The kit is complete with "Adjust-O-Pitch" pro-cut parts, insignia, cement, etc.



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Equipped with Wing Slots
and Spin Arresting Tail

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Wingspan

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England's great pursuit plane, in its latest improved version, equipped with four cannon. The model was designed from drawings and details obtained direct from England.



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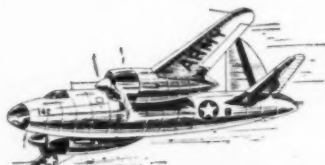
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Model S-3, Span 17"



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Model S-13, Span 15 3/8"



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Model S-4, Span 16 1/4"



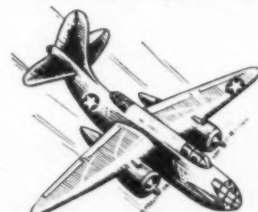
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Model S-2, Span 19 1/2"



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This tow-line launched glider equipped with Spiral Control is capable of unbelievable accomplishments. The simplicity with which you can launch makes Sinbad a real contest winner. The ease with which you can build the ship will amaze even the most experienced builders. Complete kit.



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62" Wingspan
SUPER-SINBAD

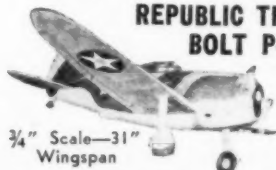
The ultimate in glider design. Tow-line launch with new "Two-Control" which permits you to steer the model to any part of the field you desire before releasing the tow line. The kit includes complete diecut "Air-Tex" parts, cement, wood veneer and silkspan covering, parts for tow-control.



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BELL AIRACOBRA P-38
3/4" Scale—27 1/2" Wingspan

One of the finest flying scale models ever designed. Its performance as a flyer amazes the experts. Complete kit with die cut "Air-Tex" parts, "Adjust-O-Pitch" propeller, insignia, cement, etc.



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REPUBLIC THUNDERBOLT P-47B
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The first authentic model of America's newest fighter. Complete kit with "Adjust-O-Pitch" propeller, "Air-Tex" die cut parts, phantom drawings, insignia, cement, etc.



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This is a book of facts about the war planes of the world. United States, Great Britain, and Russia on the one hand; Germany, Italy, Japan, and France on the other. Nearly three hundred different types are covered, and in every case the known data concerning speed, horsepower, armament, weight, load, and the like, are given. In addition, there are 116 photographs of machines in the air and on the ground, together with 104 diagrams. \$3.00 P. P.



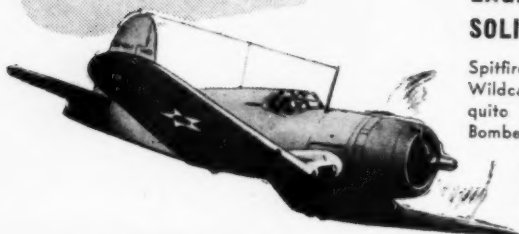
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complete Fairchild Gunner AT-21 Dura-mold advanced training planes, switching from sub-contract work on turrets, floats, bomb bay doors, etc., for Martin.

LITTLE KNOWN is Fairchild's all-Negro parts plant in Hagerstown, Maryland. Starting with six employees, plant now operated by 110 foreman, leadman and workers, turns out small formed parts, maintains abnormally high efficiency.

AIRLINES must use two hundred gallons of paint remover to clean up returned Army airliners before they can be put in service. In addition to removing gobs of paint, airline service shops spend three weeks overhauling all parts, re-fitting cabins and painting airline insignia.

FORTRESS FIGHTERS may be discontinued, according to Washington sources. Known as the B-40, these multi-gun escort giants have accompanied many bomber missions into Europe, frequently held losses to a minimum. However, after dropping their bomb loads, the lightened B-17 bombers quickly outdistance their escorts, slowed down by bigger crews and bulky drag-producing gun emplacements. Increased range Thunderbolts and Lightnings may solve escort problem.

PRATT & WHITNEY has delivered the 100,000th Wasp engine from the East Hartford, Conn., plant. This figure does not include thousands built under license by Ford, Buick, Chevrolet, Nash-Kelvinator, Continental and Jacobs. The first Wasp engine made its debut in 1925 in the Vought FU-1 Navy fighter, and gained fame installed in famed Boeing P-12 series.

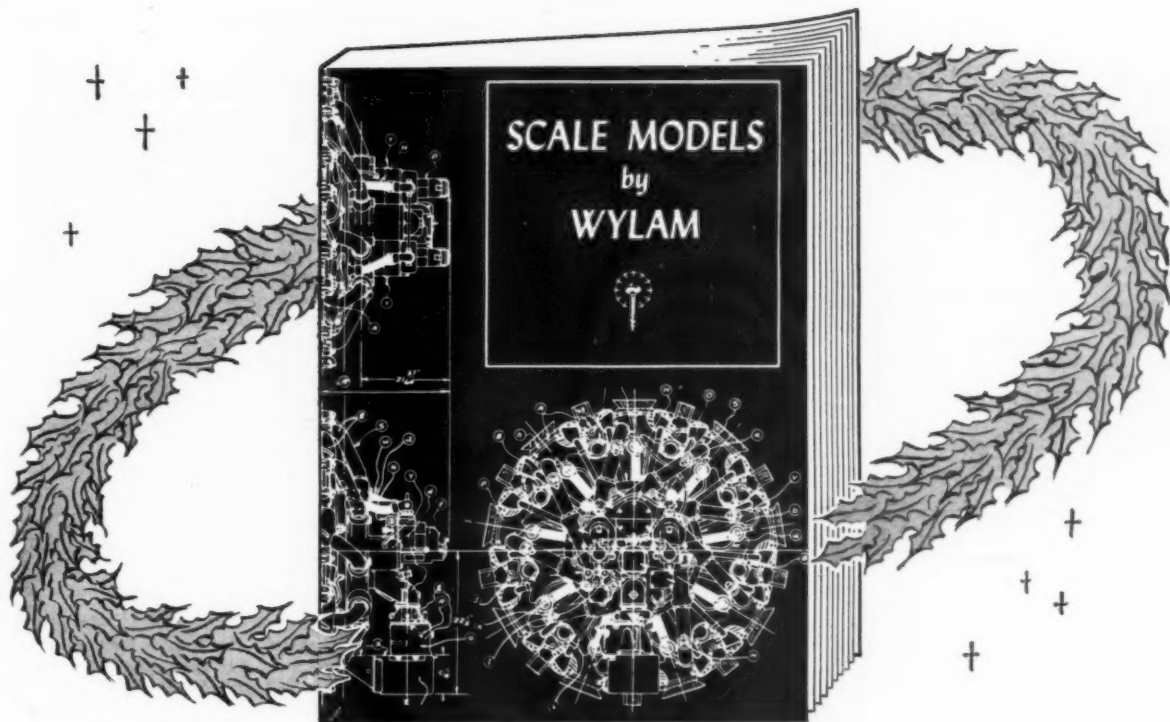
NEW SKY GIANT, now under construction by Bristol Aeroplane Co. in England, is "not just a blow-up version of the usual airplane shape but is revolutionary in structure, motive power and form." "Special" motors develop 20,000 hp and the craft will weigh 130 tons (biggest yet). Leslie G. Frise, Bristol chief engineer (aircraft), says it will carry 150 passengers at 250 mph.

OWI reports latest Douglas Havoc is fitted with a power driven gun turret.

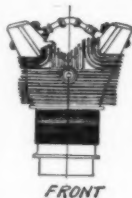
LONG a seemingly unsolvable problem, a successful airplane windshield wiper is now standard equipment on Flying Fortresses attacking Europe from bases in Britain. Actually, the wiper is installed over the single clear-panel in the nose used by the bombardier. Neither rain nor snow, etc., etc., will keep these couriers from their appointed rounds!

LATEST BRISTOL Beaufighter, certainly one of the best combat airplanes developed in this war, is fitted with bellow flaps which are operated by air pressure taken from the slip stream, thereby saving considerable weight and mechanism. Air is blown into the flap bellows from a venturi tube and conventional springs are used to return them to the closed position. As installed on the Beaufighter, the flaps have dive-brake counterparts on the upper wing surface.

(Turn to page 56)



THIS CHRISTMAS, GIVE A WEALTH OF ENJOYMENT



FRONT

The work of one of America's most brilliant young draftsmen has been compiled in this volume. More than ten years ago Wylam's genius became apparent in the field of aviation. Since then his ability for fine detail and plan layout has rapidly brought him to the top. Simplicity marks every written word and drawing, enabling even the beginner to use the plans with ease.

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Each plan contains full detail of the original ship plus an interesting story of its background. Particularly noteworthy are the Cyclone, Whirlwind, and Twin Wasp Jr. engines. These enable you to produce amazingly accurate replicas with ease. Installed on models they are beautifully realistic.

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LOOK ON PAGES 57-61

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NEW Curtiss Dive Bomber, Hawker Typhoon, Vultee Vengeance, Grumman Avenger. 85c P.P.
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Choice of 14 1/4" scale Curtiss P-40, Grumman Wildcat, Spitfire, Vultee Vanguard, Grumman Skyrocket, Bell Airacobra, Republic Thunderbolt, Jap Zero, N. A. Mustang, Heinkel Fighter, Lockheed P-38, Vought Sikorsky, Boulton Paul Defiant (By mail ea. 60c).

35c SOLIDS
1 1/4" scale, outline shape fuselage and wings, fuselage tapered, insignias, etc. Bell Airacobra, Messerschmitt, Wildcat, Spitfire, Russian Mosca, Curtiss P-40, Boeing P-26, Brewster Buffalo, Curtiss Goshawk, Spad 13, Fokker D-7 (By mail, 48c).

15" BALSA Planes 3 for 40c CARVED PROPS
for each plane!
A value highlight. Kits contain also TURNED HARDWOOD NOSE, PLUG AND WHEELS. Formed Prop Shaft, Rubber, Tinsies, colored insig. sheet, sandpaper, cement, etc. You get SPITFIRE, CURTISS P-40 and STUKA, all 3 40c

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Dept. MA1 Minimum mail orders \$1 (and 32c Dis.)

A PHOTOGRAPHIC version of the De-Havilland Mosquito bomber has appeared, a tactical weapon similar to the Lockheed F-5A. The new craft carries droppable fuel tanks under each wing and features a special low-drag, high-speed fuselage finish. The cameras are mounted in the nose and aft of the wing in the fuselage.

DR. H. C. H. TOWNEND, inventor of the famed engine cowl ring bearing his name, passed away recently in England at the age of 46. Long a scientist with the British National Physical Laboratory, Townend was also noted for his research into boundary-layer control, symmetrical airfoils and problems connected with the flow circulated by propellers installed within cylinders, all of which are of primary importance in new aeronautical developments in this country today.

THE NAVY now has a total of 18,269 planes in actual service. With the vastly expanded fleet, the United States can now claim the most powerful air-sea force in the entire world.

LATEST BRITISH naval aviation torpedo-bomber is a monoplane and is known as the Barracuda. No other details are available other than it is replacing the venerable Fairey Swordfish on board the carriers of the Royal Navy.

FIGURE THIS ONE OUT: A bomber squadron of the Chinese Air Force is equipped with Russian Tupolev SB-2 twin-engine medium bombers!

LATEST BELL Airacobra is the TP-39 and, believe-it-or-not, it is a two-place version of the famed fighter. The new seat is located forward of the pilot, and the student (it is to be used for training purposes) straddles the prop drive shaft. Fully enclosed in a streamlined windshield, Bell officials claim the new crew member does not impair the planes' performance in any way.

VICTORY

Torpedo!

(Continued from page 38)

considerable range. These planes earned the respect of British sailors and airmen in the Mediterranean, and were ideal weapons for the geographic position of the country which produced them.

With her ocean frontiers of huge distances, Japan could fight a defensive naval war, never bringing her battle-ships into action and protecting them by a perpetual screen of submarines, making it almost impossible for aircraft carriers to approach near enough for their aircraft to operate.

The land-based torpedo plane is one answer to such a problem. With suitable island bases at our disposal the heavy units of the Japanese fleet could be brought under attack. What a horizontal bomber cannot do against the modern battleship with its increased deck armor, the torpedo plane can achieve; if it is given sufficient range to get within striking distance of its enemy. One torpedo per plane is enough to do effective damage. With this comparatively light load

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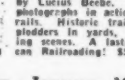
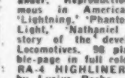
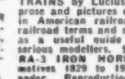
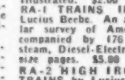
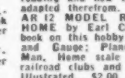
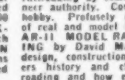
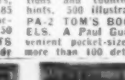
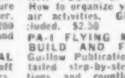
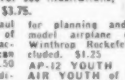
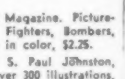
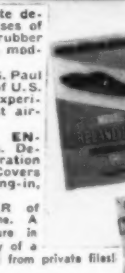
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the torpedo plane can be given a range of action that seems almost fantastic. It is interesting to note here that the Italian air force has a four-engine Cant Z.511 torpedo plane credited with a 2500 mile range, and that another Italian plane with a load of 2000 lbs. and crew covered over 5000 miles in a closed circuit thus setting up an unofficial record, the same type of machine later setting up a world's record for close circuit flight of 8038 miles July 30-31, 1939.

With extra tankage the range of our existing heavy bombers could be stepped up without loss of speed or defensive armament, enabling them to carry one or two torpedoes to Japanese waters. Ships such as the Martin Mars or others of the Fortress type might well be used as long-range torpedo bombers with considerable effect, especially as they are both capable of sufficient speed and can carry the heaviest defensive armament with sufficient ammunition to fight a lengthy engagement.

In defending their homeland and occupied possessions against our amphibious attacks the Japanese are certain to use land-based torpedo bombers, utilizing the best features of Italian and German models. The answer to these will be better U. S. torpedo planes with a longer range and more deadly punch.

VICTORY

Hellcat

(Continued from page 17)

family had grown to one hundred. The need for more room brought the firm to an abandoned hangar on Curtiss Airport, Valley Stream, Long Island, and Grumman was hard at work on a radical new Navy fighter plane, a two-seat which added the fire-power of a rear gunner to the conventional single-seat Navy fighter as well as a retractable landing gear and a top speed considerably in excess of any recorded in previous fighters. On December 29th, 1931, the little plane was delivered to the U. S. Navy and proved an instant success. Known as the FF-1, it was the first military airplane to go into service with retractable landing gear and fully enclosed cockpit. Powered by a Wright Cyclone, 9-cylinder radial, air-cooled engine, the FF-1 had a top speed of 216 miles per hour and a cruising range of 650 miles. Armament consisted of one machine-gun firing through the propeller and one machine gun in the rear cockpit, handled by the gunner.

With the installation of additional equipment, dictated by the Navy's need for a scout plane of superior performance, the ship was designated the SF-1 and on August 20, 1932, the first of an extensive series went into Navy service. Quantity orders demanded more space, and the firm was moved to larger quarters at Farmingdale, Long Island (its present home factory) on Nov. 10, 1932.

Grumman's principal interest resided with his first love, the amphibian, and he put all of his experience plus a great deal of hitherto untried details, into what later became the most successful military amphibian ever designed.

20th CENTURY-FOX Offers..

Dust off those crates, men—we've got a swell offer from Winfield R. Sheehan, motion picture producer, who shortly will begin filming "Rickenbacker—Story of An American," for Twentieth Century-Fox Films!

Mr. Sheehan will pay the sum of six hundred dollars (\$600) in War Bonds—\$150.00 each for four model planes—to some of you lucky men if you happen to possess the model planes listed below, and if Twentieth Century-Fox purchases them for use in the motion picture relating the life story of Captain Eddie Rickenbacker!

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If you happen to have one of the above models, simply do this: Photograph the model; on the back of the photo list all features, details and specifications. Send the photo to:

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Twentieth Century-Fox will confer with the editors of *Model Airplane News* in selecting the four planes best suited to the needs of the movie.

Each man whose plane has been selected will then be notified to send Twentieth Century-Fox the actual model, for the sale of which he will be paid \$150.00 in War Bonds.

Please keep in mind the following facts:

1. This is not a contest; it is a business transaction.
2. Do not send the actual model; send photographs and specifications only!
3. Do not build a model especially for this offer: Twentieth Century-Fox is interested only in those already built. If you already have one or more of these models, mail the photo and you may be one of those who makes himself \$150.00.
4. Speed is essential, because the movie goes into production shortly. There's the opportunity, men—your model plane or planes in a great Hollywood production and \$150.00 in War Bonds. So get going on those photographs!

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No Pictures ??

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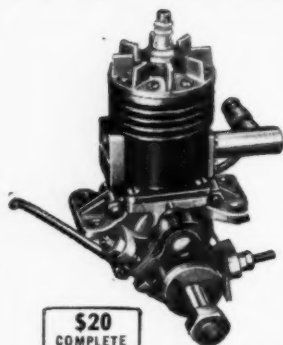
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Known as the JF-1, the big 3-seat biplane was immediately accepted by the Navy and, again, quantity orders resulted. From its first flight, on May 4th, 1933, the “ugly duck” became a sign post of Naval Aviation, and the JF-2 and JF-3, modifications of the basic design, followed in short order.

The following year the remarkable Grumman single-seat fighter was born, in the F2F-1, from which today's deadliest Navy fighter was developed, which first flew on October 18th, 1934. An instant success, it quickly joined the carrier-borne Navy aviation force and became familiar to every follower of Naval Aviation.

1935 saw further developments of the firm's two outstanding types, and the J2F-1 was flown on June 25th. An improved version of the JF, it saw immediate acceptance by the Coast Guard. The F3F-1, an improvement over the F2F, was flown on March 20th, 1935, and corrected several errors in design in the earlier F2F. The fuselage was lengthened considerably to give greater directional stability, smaller landing gear wheels were used and a larger engine installed.

In an attempt to improve the widely-used FF-1 and SF-1, the Grumman organization produced the experimental XSBF-1, which was basically the earlier model with increased equipment, improved engine cowlings and further service refinements. For the first time, however, the successful Grumman firm had stumped its toe, for the SBF was not a success and no Navy orders were forthcoming. The single-seat fighter continued to be improved and the F3F-2 was pro-

duced, powered by the big Wright Cyclone engine of 1,000 horsepower. This ship flew on July 27th, 1936, and a series was ordered.

On April 8th, 1937, the company moved into its very first factory building, designed and built from the ground up for its use. Spacious, efficiently arranged production facilities were now available to Grumman Aircraft Engineering Corporation which, by now, was recognized as an outstanding producer of Navy fighters and an important link in national defense. On December 23rd, 1937, Naval Aviation was given a Christmas present which, five years later, it was to appreciate from the bottom of its heart, for on that day the F4F-1 Wildcat took off for its first flight. A monoplane of exceptional performance, it quickly found favor with the carrier-based squadrons and soon replaced the older and slower F3F biplane fighters.

The firm concentrated on the production of large quantities of the new Wildcat as well as the improved J2F for the next two years when suddenly Germany marched into Poland and the second World War became a reality. Grumman was immediately approached by Mr. Purvis of the British Purchasing Commission regarding the possibility of British purchases of the new fighter. Released by the Navy, the first Grumman Martlet, Royal Navy version of the F4F, was flown on July 27th, 1940. Orders were signed and production was commenced on a large quantity of Martlets, which are still in service on British carriers.

One of the most astounding fighter machines ever designed took the air for the first time on April 1st, 1940. It was the amazing Grumman XF5F-1, a twin-engine, low-wing fighter which featured a complete absence of a nose, the fuselage commencing about half way back on the chord of the center section. The radical new Skyrocket proved itself capable of speeds far in excess of any airplane flying at the time. However, its high speed was detrimental to its handling characteristics, particularly during take-off and landing and, once again, Grumman stumped his toe. Only the one

experimental ship was built and the Navy expressed no further interest in the type.

However, August 1st, 1941, brought the first TBF-1 Avenger take off and, again, Grumman had scored a signal success. In wide use today, it is the standard torpedo-bomber of Naval Aviation.

Pearl Harbor found a single squadron of Grumman F4F Wildcats (Christmas presents of 1937, remember) on lonely Wake Island which was assaulted by the Japanese Navy the following day. The Defense of Wake Island, from December 8th to 23rd, 1941, sent Grumman's name plummeting into the nation's Hall of Fame, for it was the Wildcat that wrote one of the most stirring pages in the history of the U. S. Marine Corps.

On February 20th, 1942, Lieutenant Edward H. O'Hare, aloft in a Grumman Wildcat, encountered a formation of Japanese planes and, before the remainder straggled into the distant clouds, he had downed five of them over Midway Island. The Grumman Wildcat's position in the hall of fame was secured.

With production lines spouting Wildcats and Avengers, Grumman paused on April 16th, 1942, to receive the Navy “E” for excellence of production, the first aviation manufacturer to be accorded that honor. And on June 14th, 1942, the first Avengers went into action to begin a string of successes which has not yet been broken.

But behind the scenes Grumman had been quietly working on his drawing board on a new-type fighter that would not be the result of standard specifications as agreed upon by the Navy, but would be a fighter designed by the fighter pilots themselves. He was in deep conference with heroes and just plain guys for many weeks but each man of this entourage had one thing in common: he had fought the Jap Zero in the Pacific and he knew just what he wanted in a plane to beat the Zero. Incorporating all of these opinions into one single fighter design, Grumman watched it take shape in the secluded experimental portion of the factory. On June 26th, 1942, the first Grumman F6F-1 Hellcat took to the air, and it is this latest of a long line of successful Grumman fighters that is our Plane on the Cover this month.

The Hellcat is now in action against the Jap Zeros and is filling the skies with flaming Nips as this is being written. Powered by a Pratt & Whitney Twin Wasp R-2800 18-cylinder, double-row, radial, air-cooled engine equipped with a two-speed, two-stage supercharger, the Hellcat carries the greatest power ever packed into a Navy fighter's nose: 2,000 horses at high altitude! Its batteries of .50-caliber machine guns, self-sealing tanks, plenty of armor-plate and safety devices, make it the most potent thing in service with the carriers today. The Navy says it's the most maneuverable airplane anywhere and the deadliest gun-bus yet to meet the Japs. Navy pilots, who have flown it, proclaim it a dream to fly. “It's got everything we wanted!” they exclaim. And it should have; they ordered it custom made!

VICTORY



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A REAL 6-FOOT PLANE

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It's the same old, friendly establishment—the same helpful personnel to serve you—but NOW, we've plenty of room—to properly display the enormous variety, show lots of finished models—and plenty of room for you to meet and chat with fellow modelers! And a specially attractive window display! Come in, you are welcome! Season's greetings from

POLK'S

40" PIONEER

\$150

STREAMLINED MONOCOQUE DESIGN

FLYAWAY

Unique Flying Scale Models

LOOP, DIVE, HEAVE-HOP

Camouflaged, easy to assemble. Retractable landing gears in each. Airacobra, Mustang, Warhawk, Spitfire, etc., Russian, 1-18.

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Over 780 Pre-Fabricated Parts

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Available in 3 popular sizes, GIANT SCALE, 1 1/2" scale. Many detailed pre-fabricated parts. NOW Only \$1.00



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ANTI-TANK GUN

Precise facsimile of "in the news" weapon. Fully detailed. 1 1/2" scale...40c (By mail 50c)

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1 1/2" scale of new Half-Track. Half Wheels vehicle! Movable wheels and track, kit is complete in every respect \$1.50 (By mail \$1.65)



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1 1/2" scale, used with Jeep and Truck. Turned wheels included. Super detailed kit includes OD covering. (By mail 50c) 40c

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Whip control wire, 100 ft. spooled...50c BAMBOL CONTROL POLE, 8 ft. postpaid...85c

Glide, circle, descend at will! Complete kit \$1.25 (By mail \$1.40).

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Twin-Engine Bomber. All parts cut to shape, turned engine nacelle cowls, die-cast props, 17" span. \$2.50 (By mail, \$2.75)



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Lockheed-Hudson Bomber \$7.50; Douglas Dauntless \$5.50; Grumman Skyrocket \$2.50; Hawker Hurricane \$3; P-48 Wildcat \$3; P-38 Lightning \$4; Brewster Buffalo \$3; Thunderbolt \$4; Stuka \$7B \$3.50; Spitfire \$3; Messerschmitt \$3; Corsair \$3.50; Curtiss Helldiver \$3.50; Mustang \$3; Airacobra \$3; Curtiss P-40 \$3 (By mail—Add 30c to cover packing postage).



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GIANT SIZE models. Complete kits include full size plans. Choice of Lockheed P-38, N.A. Mustang, Airacobra, Curtiss P-40, Hawker Hurricane, Messerschmitt ME-109. (By mail: \$1.65). \$1.50

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More POLK NEWS on PAGES 56, 57

Model Airplane News - January, 1944

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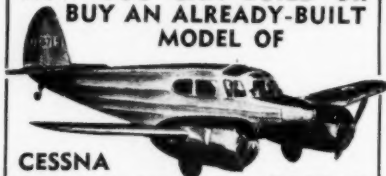


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CLUB NEWS

New York

Simon Waitzman, David Tuman, of New York City, have decided to name their club "The Hell Cats." They would like the boys interested in joining the club to have ages ranging from 12½ to 15 years. Any applicant who wants to join this club should call Simon Waitzman at Dickens 2-1204 at 9:00 P.M., Monday through Friday. Members should preferably reside approximately 1-1½ miles from Tilden High School, or Kings County Hospital. Information regarding time and place of meeting will be discussed over the 'phone. The club is being formulated for those who are interested in building model airplanes and learning the principles of pre-flight flying.

Canada

Chris Falconar, Hudson Heights, Quebec, announces the formation of the Hudson Model Aircraft Club formed by a group of Canadian modelers. Chris is president, Bill Ritchie is vice-president, Michael Ford and Jim Wheeler are secretary-treasurer, and Harold Bygate is the business agent. The club is divided into two sections as the members are so widely separated. The business agent goes into Montreal (32 miles distant) and purchases supplies needed by the members. (This is an idea for other clubs—a purchasing agent).

California

The Northrop Model Club, Hawthorne, Calif., contest was won by Victor Leroux of Department 27, earning him his third and final place on the N.R.C. Perpetual Trophy for Model Airplanes. After six weeks of preparations he entered the contest with models in each of the three classes. Plagued by poor batteries, he finally got going to win first in A and B classes. The class B model made two of the few thermal flights of the day after having spun in on the first attempt.

Tom Laurie of Department 20 improved his third place of the previous contest by moving up into second place in this contest. His big beautiful black and yellow model soared away on its second flight to establish a time in Class C that was unchallenged by any other flight in that class.

Paul Hildebrand, also of Department 20, consistently piled up points in three flights to establish a high average that

netted him an unquestioned third. His sensational yellow model was again the old reliable of the contest when it caused no trouble to start or fly.

The third reason for Engineering's high standing in this contest was Dan Kilgore of that department placing fourth although handicapped by a series of crashes that demolished one of his models and seriously damaged another. These models are of his original design and made fine flights, crashing only because of motor failure at a critical point in the takeoff.

The Club Commissioner, Paul Sowles, placed fifth after spending three hours in getting the bugs out of his motor.

Navy Troop Glider

(Continued from page 13)

this is true, stringers are cemented right to their sides. Attach the formers to their respective places and then add the fairing stringers. It will be noticed that the bottom "keel" is deeper than 1/16" and thus it should be cut to shape from sheet stock. Formers 1, 2 and 3 are for wind-shield supports, made from bamboo bent over a soldering iron or candle flame.

Correct angular placement of the wing and stabilizer is important. From sheet cut required pieces for these mountings so they will be exactly as shown. The wing slot is large enough so it can be slid through for dismounting.

Roughly shape the nose from balsa or other light wood, then cement it fast and finish to exact size and shape. Launching hooks are shown; they are bent from .040 music wire. Securely fix them to place by binding with thread.

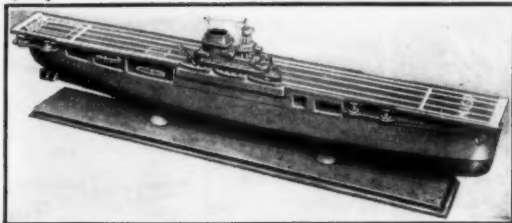
Light, non-warping construction is used for the tail surfaces. Both rudder and stabilizer are similar; the latter is built in one piece despite the half-plan shown. Make a flat frame for each using 1/16" sheet for outlines and 1/16" sq. for spars and ribs. When these frames are dry add 1/16" sq. strips to each side of each rib. These are then cut streamline and the edges trimmed to blend with the cross-section curvature.

Only a right-wing plan is included on the plan, so a left one must be drawn. Construction is conventional and easy. Ribs are 1/32" sheet; the spars are cut to shape shown from material indicated. Wing tips are ¼" sheet. Make two of each part, carefully shaping them correctly. Assemble the wing in two parts working right over full size plans; pins will aid in holding the parts in place until cement hardens. Once assembled, join the halves with 2½" dihedral at each tip. Taper leading and trailing edges to conform to the airfoil shape and smooth off the tips.

Before the frames are covered they should be worked over with fine sandpaper. Sand each part of the structure lightly but thoroughly to remove all roughness and flaws.

Colored tissue is used for covering since it is both attractive and practical. Banana oil or light, clear dope serves well as the adhesive to stick the tissue to the frames. Numerous small sections of paper will be required to make a

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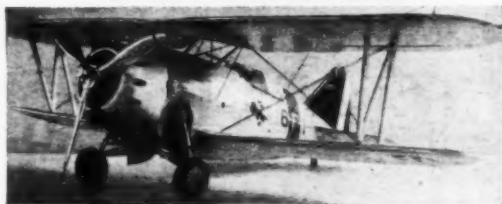
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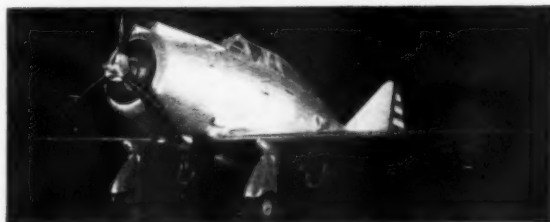


32" Span. Length 24". 1" Scale

A fine detailed model with retractable landing gear, 4" turned motor front, 3 oz. grey dope, 1/2 oz. yellow, 2 oz. glue etc., all parts printed, 10" propeller, wheels, full size drawing, and all parts. This fighter plane is used in large numbers on the aircraft carriers. Const. Set complete.....

\$3.75

SEVERSKY P35A ARMY PURSUIT



32" Span. Length 25". 1" Scale. Color, Silver

Set has 4" turned motor front, 10" carved prop, wheels, tail wheel, all parts printed, 3 oz. grey dope, 1/2 oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. New improved model has retractable landing gear and movable controls from cockpit. Set.....

\$3.25

CURTISS P36A ARMY FIGHTER



37" Span. Length 27". 1" Scale

A very strong model. Can be converted to gas motorized control line type, using A or B Class motor. Set has turned 4" motor front, paints, and all parts. Set.....

\$4.00

BELL P39 AIRACOBRA U. S. ARMY FIGHTER

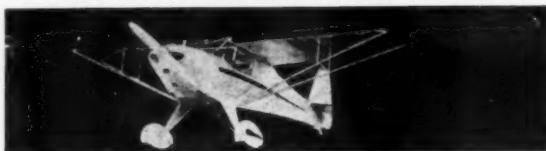


34" Span. Length 29". 1" Scale

New fighter to scale, parts printed, paints, glue, etc., wheels and all parts. Set.....

\$3.50

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36" Span. Length 22". 1" Scale. Weight 2 oz.

COMBINATION LAND AND SEAPLANE SET

A beautiful exact scale flying model with unusual flying range, so light it will rise from land in 6 feet. Const. set contains all parts printed, hardwood wheels, 2 oz. white dope, 1/2 oz. black glue, full size scale drawing and all parts to build. Set.....

\$1.50

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CURTISS HAWK FIIC4 NAVY PURSUIT



32 1/2" Span. Length 22 3/4". 1" Scale. Color grey, top wing yellow

THE MOST EXCLUSIVE AND FINEST MODEL IN THE WORLD. MOVABLE CONTROLS WORK FROM COCKPIT. One of the most beautiful models ever made. Set has all parts printed, insignia, instrument board, step plates, ready cut wheel pants, 6 oz. colored paints, glue, large full sized drawing, turned wheels, and all parts. Const. set.....

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40" Span. Length 35". 5/8" Scale. Color Silver

A beautiful model of the world's fastest bomber. Set has all parts printed, propellers, wheels, insignia, 4 oz. grey paint. 1 oz. black, motor fronts full size scale drawing, and all parts to build. Construction set.....

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Thousands of this type of plane are fighting for the U. S. and Britain

CURTISS P40F WARHAWK GAS MODEL



48" Span. 1 1/3" Scale. Gas Model De Luxe

One of the strongest models ever made. Model has planked balsa body formers, ribs, etc., all parts printed on balsa, spinner, insignia, glue, clear dope, full size drawing, and all parts. Model uses either "B" or "C" class gas motor. "U" control or free flight. Set, without motor.....

\$9.00

BOEING F4B4 NAVY FIGHTER



22 1/2" Span. Length 14 1/2". 3/4" Scale

A finely detailed model. Set has all parts printed, wheels, insignia, set of colored paints, full size drawing, and all parts. Set.....

\$2.95

smooth, wrinkle-free job on the fuselage—lap the individual pieces carefully. To make the fuselage bottom more resistant to holes as the result of rough landings, it is a good idea to double cover it. The top and bottom surface of each half of wing and tail surfaces requires a separate piece. Tips likewise should be covered with individual sections. Spray the covering lightly with water in order to tighten it.

Before assembling the major parts complete the cockpits. Thin celluloid is used. It can be obtained from cleaned photo negatives. Cut individual sections for each space and be sure to avoid cement smears when fastening to place. Structural enclosure details of the real plane are effectively represented by thin strips of black tissue doped to the surface.

Cement the tail surfaces in place before applying any clear dope. The horizontal tail extends partially beyond the fuselage rear including all the elevator section. Be sure surfaces are at the proper angles—the stabilizer flat atop its mount and the rudder with no offset. Now brush one or two coats of clear dope over all the model. To fit the wing in place slip it through the fuselage opening and secure it with a rubber band. This removable wing feature facilitates transportation and storage, and since the wing is free to move slightly, there is less chance of damage in the event of collisions.

Details such as control surface outlines, flaps and insignia are effectively represented by colored tissue.

FLYING: First test flights are shoulder height glides. In all probability the center of gravity will require adjustment to bring about an even, light descent. If it stalls add weight to the nose in the form of lead or B-B shot—this can be installed in a reservoir drilled in the nose block.

For tow-line launches first use a short length of thread with a small wire loop attached. If the air is calm slip the loop over the rear launching hook, but if it is windy use the front one. Tow the model into the wind running only as fast as necessary to make it climb quickly. Pull the ship well over-head and gently release it in a level attitude so that it doesn't stall. The glide should be smooth and flat with a definite turn in either direction. If not make minor weight readjustments or slight warping of the flying surfaces to get the desired turn.

Soaring flights of considerable duration are more easily attained by towing the model to greater altitudes. After the little ship is properly adjusted, a thread of 100 ft. to 150 ft. length may be used. Generally it is best to launch a tow-line glider slightly cross-wind in the opposite direction of the natural turn so a straight tow can be made. In the event it starts to turn while being pulled aloft, run towards the inside of the circle and it will again regain a level attitude. And by the way, if those billowy cumulus clouds are floating majestically overhead, you had better have your name and address on your Navy trooper and be prepared for a good run, for it's very likely to hitch a ride.

VICTORY

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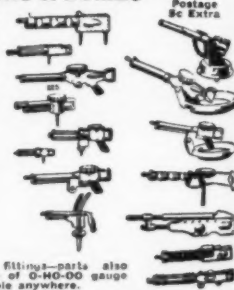


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Model Airplane News - January, 1944

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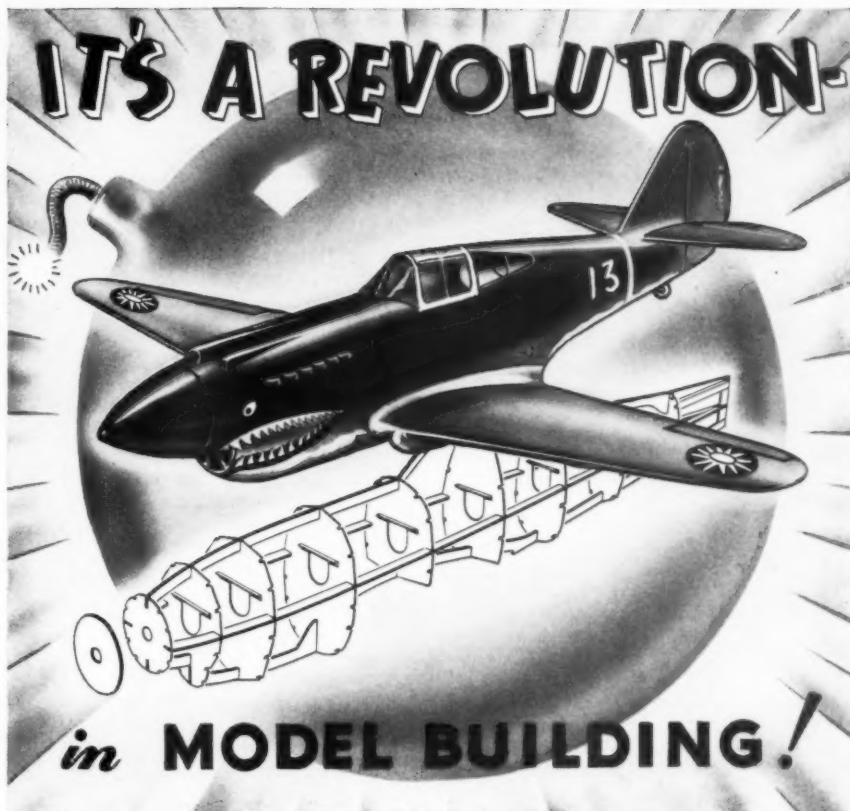
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SPEED-O-MATIC KITS ARE COMPLETE with formers cut out, wheels, cowlings, printed windshield and wing fillet patterns that actually fit, colored insignia, etc.

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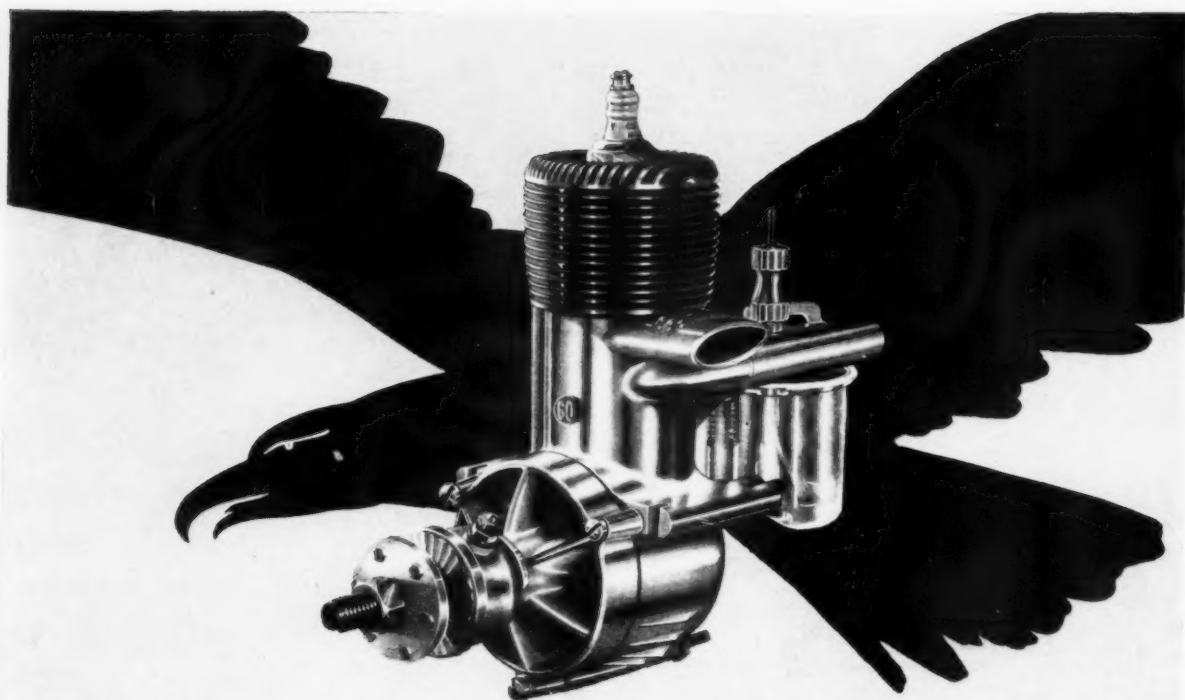
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